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# A STATUS REPORT

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## Practical Arts Programs

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## Secondary Schools in Alberta

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# ACKNOWLEDGEMENTS

This paper has been prepared by Jane Sereda with the assistance of Sharon Prather and Alex McCaughan and other members of the Practical Arts Team. Special appreciation is extended to Information Services personnel, Harry Henshaw and Debbie Shybanka for their work in compiling and analyzing provincial data.

Acknowledgements are also extended to the wordprocessing staff of the Curriculum Design Branch, Brenda Hawrysh, Mary Fithen, Lynne Tetzlaff and Dianne Hohnstein.

# PREFACE

This document describes the present practical arts programs in Alberta secondary schools, including learning environment, enrollment patterns, delivery systems, and local school system initiatives.

Information has been gathered from Alberta Education records and high school student records and from discussions with school superintendents and other school administrators around the province.

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The practical arts program in Alberta includes courses in junior and senior high schools. The junior high programs include typewriting, computer literacy, home economics, industrial education, and agriculture. In senior high, practical arts programs include courses in agriculture, business education, home economics, industrial education, and work experience. These courses are part of the junior and senior high school "complementary" course offerings which provide a variety of learning experiences that students and schools can select to meet the educational goals of an individual or a community.

*Practical Arts review includes:*
*Junior High Practical Arts Courses*
*Senior High Practical Arts Programs*
*Work Experience Programs*

## PHILOSOPHY OF PRACTICAL ARTS PROGRAMS

Within the diversity and variety of the practical arts programs in Alberta schools, a number of commonalities identify a unifying philosophy or belief system.

*Philosophy or belief system*

First, practical arts courses involve students in concrete, practical experiences in the learning situation. Both theoretical and technical concepts are identified in a practical setting, and students are challenged to use the knowledge of these concepts to solve problems and improve actual practice and skills. Many students who experience difficulty with an academic approach to learning find this experiential style of learning very effective. The tactile learning modes used in the practical arts are developmentally appropriate for many secondary students.

1. *experiential learning*

Second, practical arts courses extend or complement the knowledge, skills and attitudes from core courses in the school curriculum. These courses develop the arts and sciences in applied settings where good practice consolidates the academic knowledge and helps students make the transition from the abstract to the application. Social interaction skills are also included, as students must work in a cooperative mode or as productive teams in the practical arts setting. Many students, who may be having difficulty in core subject areas, are more successful in this applied, cooperative learning environment. The success they experience in these courses helps build the confidence and encouragement needed for increased success in all other school endeavors. Practical arts courses simulate the challenges of independent living within a protective, nurturing environment, helping students build confidence in their ability to manage their lives successfully.

2. *enhance and extend academic learning*

Third, practical arts courses are designed to provide a range of experiences which begin with the exploration of a subject or trade area and may extend to the development of very complex skills and concepts that represent the state of the art practices found in the workplace. Course offerings in most schools help students explore careers, build personal management and life skills, or develop leisure activities. The

3. from exploration to occupational preparation

more senior level courses offer students the opportunity to develop skills that support entry into post-secondary institutions for further training, or into the workforce, including entry into apprenticeship programs.

Practical arts courses provide opportunities for students of all ability levels to identify and develop aptitudes and capabilities that lead them to the productive use of occupational and leisure time.

4. *partnerships*

Fourth, many practical arts programs build close partnerships between schools and their communities through curriculum development activities, teacher preparation, and student involvement in community and workplace activities. Provincial and local school board advisory committees involve representatives from business and industry in the development, evaluation and revision of practical arts courses offered in secondary schools. Teachers in the practical arts generally bring experience from business and industry as part of their background preparation; upgrading courses are accessed by many teachers as part of ongoing professional development activities. Some students are able to take advantage of cooperative experiences in the workplace through established practical arts course structures such as work experience and work study, as well as through innovative arrangements such as job shadowing, field trips, and off-campus instructional arrangements.

5. *realistic environments*

Finally, practical arts courses are provided in settings that, as far as is feasible, replicate realistic environments commonly found in business, industry and family homes. Classroom and lab facilities provide tools and technologies that are used in the production of goods and services provided in the work world. Students practice effective and efficient use of personal and material resources in activities that require skills, decision-making, and good management practices. Course structures encourage students to work both independently and cooperatively, to use initiative and creativity, and to recognize consequences and take responsibility for their activities.

## DESCRIPTION OF THE PRACTICAL ARTS PROGRAMS

### ELEMENTARY SCHOOL EXPERIENCES

There is no provincial curricula specifically developed for elementary schools in the practical arts, but many of these young students develop a skill and knowledge base through local extension of the core programs in language arts, mathematics, science and social studies. Health programs help introduce elementary students to various careers. Keyboarding and computer skills are practiced in many classroom activities, and relationships between individuals,

families, communities and their environments form basic concepts for study in the social studies. Computer rooms or classroom-based computers are available to almost all Alberta elementary school children. In some school districts, efforts are made to articulate keyboarding and computer literacy skills from the elementary school experience through to the high school.

*articulation of keyboarding and computer literacy skills is a focus of consultant and teacher activity in, for example:*

*Calgary Board of Education*
*Grande Prairie School District #2357*

"Integrated Practical Activities" (I.P.A.) was a set of teaching strategies introduced by Alberta Education in 1976 to help elementary teachers incorporate the concepts of work, the use of tools and the use of materials within core elementary subject areas. Teachers were provided with simple activity ideas from home economics and industrial education that could be safely used in a classroom to extend experiential learning from academic subject areas. Some of these activities continue to be used in Alberta schools.

## JUNIOR HIGH SCHOOL PRACTICAL ARTS

Alberta Education requires that a minimum of 225 hours of instruction per year in three complementary courses be offered in grades 7, 8, and 9. These include the provincially developed courses in practical arts, second languages, fine arts, and religious studies and some locally authorized courses.

*A minimum of 950 hours of instruction is required at each grade level. 650 hours minimum in core courses and 225 hours in complementary courses.*

Almost all junior high students in the province have the opportunity to enroll in some practical arts courses. For many students, one or more of these courses is mandated by the school or school district.

*See Appendix I, Superintendent Survey for further information.*

Provincially developed courses are available in agriculture, business education, home economics, industrial education computer literacy and typewriting. Curriculum is recently developed in Computer Studies (to replace computer literacy and typewriting) environmental and outdoor education, agriculture, and is planned in business studies. Home Economics is a three year sequential program including the three strands, family studies, food studies and clothing and textile studies. The industrial education program at the junior high consists of modules in the areas of power technology, materials technology, communications technology and synthesizing (application module). Although not all junior high students go on to take the related high school programs, the junior high courses have been developed to articulate with the high school practical arts programs.

*Agriculture: Land and Life 7, 8, 9*
*Computer Literacy 8 (Computer Studies)**
*Typewriting 9*
*Industrial Education 7, 8, 9*
*Home Economics 7, 8, 9*
*Business Studies 9 **
*Environmental and Outdoor Education **

** These programs will soon be available*

*All of the above courses have a recommended time minimum of 75 hours. Appendix 2 provides a description of junior high practical arts courses*

Under guidelines established by Alberta Education, local school jurisdictions may provide locally developed complementary courses at the junior and senior high levels. Examples of locally developed courses available in some junior high schools which have similar content to the practical arts include: Hunter Training, Outdoor Education, and Project Business.

*See Alberta Education Education Policy Manual*

## SENIOR HIGH SCHOOL PRACTICAL ARTS

An extensive array of practical arts courses is available at the high school level. There are course sequences in agriculture, in nine strands of business education, in three content areas of home economics, in more than a dozen different career areas in industrial education, and in work experience. There are more than one hundred provincially developed courses in the practical arts. These courses are largely delivered in 5 credit* (125 hour) time allotments, but many courses are available in 3, 4, 5, 10 or even 15 credit allotments. This flexibility allows schools to adapt program lengths for such situations as timetabling constraints or the need for increased classroom time for specific skill development. An individual student may accumulate 35 or more credits in a practical arts subject sequence.

| Course Area | Credits | No. of Courses |
|---|---|---|
| Agriculture | (3)(5)(10)(15) | 3 |
| Bus. Ed. | (3)(5)(10) | 29 |
| Ind. Ed. | | |
| General | (3)(4)(5) | 7 |
| Careers | (5)(10)(15) | 127 |
| Home Ec. | (3)(4)(5) | 9 |
| Work Exp. | (3)(5) | 3 |

*A complete listing of practical arts courses is found in Appendix 2*

### Business Education

The business education program is composed of 104 one-credit modules, organized into nine strands. Modules are designated as core and elective. Some modules must be taken in sequence. There is considerable flexibility to develop 3 or 5 credit courses that address individual student needs and skills. Students may obtain over thirty credits in business courses and attain skills for personal use or for a career in the secretarial field, accounting, and business management. Some of these courses are recognized for advanced standing in post secondary institutes of technology.

*Business Education Strands:*
- *Accounting*
- *Basic Business*
- *Computer Processing*
- *Law*
- *Marketing*
- *Office Procedures*
- *Shorthand*
- *Typewriting*
- *Business Education (Optional)*

### Home Economics

The home economics program is composed of 64 one-credit modules, organized into three subject strands. Programs for students can be individualized through the selection of modules, but a course is developed from within a particular subject. Core and elective modules are combined to form 3, 4 or 5 credit courses at each grade level. Food studies and clothing and textiles courses must be taken as a sequence and the 30 level of these courses is accepted for entry into several university faculties. Personal living skills courses are non-sequential.

*Home Economics Strands:*
- *Clothing and Textiles*
- *Food Studies*
- *Personal Living Skills*

### Industrial Education

Industrial Education - General

The Industrial Education - General 10, 20, 30 courses afford an opportunity for the exploration of a variety of career areas. Courses may be tailored from a selection of 56 modules of study to meet the individual needs of students and to take advantage of the skills of teachers and the specific resources in the school facility. Industrial Education 10 may be organized to provide students' entry into a more senior level of an industrial education - careers program.

***Industrial Education - General Fields of Study***
- *Electricity-Electronics*
- *Power Technology*
- ***Materials***
- ***Visual Communications***

*One credit is equivalent to 25 hours of classroom instruction.

Industrial Education - Careers

The Industrial Education - Careers 12, 22, 32, program is organized into six career fields that focus on occupational exploration, orientation and preparation. Within each career field students build skills and knowledge related to specific technical occupations. The '12' level courses introduce basic skills, processes and knowledge. At the '22' and '32' levels, students develop more specific skills and knowledge related to an occupation. Successful completion of seven, specified 5-credit courses may qualify for credit towards a journeyman's certificate.

*Industrial Education-Career Fields:*

- *Graphic Communication*
- *Mechanics*
- *Construction and Fabrication*
- *Electricity-Electronics*
- *Personal Services*
- *Horticulture*

### Locally Developed Courses

In addition to the provincially developed courses, more than sixty locally developed courses in the practical arts have been approved for use in senior high schools. Some of these courses, such as aircraft maintenance, are specifically designed to meet local industrial demand. Many others, like service station operation and fabricare technology, have been locally developed for use by schools offering special programs for the student who has experienced difficulty in achieving.

## DELIVERY OF PRACTICAL ARTS PROGRAMS

The delivery of practical arts programs in secondary schools requires specialized facilities and resources beyond those required to deliver a classroom based school program. Three areas of support discussed here are financial support, provision of facilities, and professional staffing.

### FINANCIAL SUPPORT

Funding to support the delivery of practical arts courses in Alberta schools is provided by Alberta Education and school systems. In addition to provincial grants provided through the Basic Instructional Grant for every student enrolled, grant programs are available for certain industrial education courses and for specific equipment used in offering these courses. In some cases students are required to pay a local fee for a course or project.

*Funding of Practical Arts Programs*

*Provincial Financial Support*

*Basic Instructional Grants*

*Vocational Program Grants*

*Building Quality Restoration Program Grants*

*School System Financial Support*

*Local Fees*

## Grants

Industrial Education - Careers courses receive specific operational grants if teachers hold journeyman credentials (or equivalent) in the area of instruction, and where classes operate in facilities approved by Alberta Education. All of the larger urban school boards, but only some of the rural boards, receive these grants. Vocational education grants were established to recognize the extra costs involved in the operation of smaller classes and more expensive facilities and materials for all Industrial Education 12, 22, 32 courses and Practical Arts 15. One quarter of the superintendents surveyed noted that their jurisdictions offered some Industrial Education 12-22-32 courses that were not funded because of teacher qualification or facility deficiencies. The other practical arts programs (business education, home economics and industrial education - general) do not receive operational grants.

*Vocational Education Grants - (000's)*

| | 1986-87 | 1987-88 | 1988-89 |
|---|---|---|---|
| Total Grants | $5,839 | $5,150 | $5,299 |
| No. of jurisdictions receiving funds | | | |
| - rural | 19 | 17 | 20 |
| - urban | 14 | 14 | 15 |
| Amount of Support (CEU) | | | |
| 12/15 | 19.55 | 19.70 | $20.40 |
| 22/32* | 39.05 | 39.40 | $40.80 |

*requires approved facilities and courses must be taught by teachers with journeyman or equivalent qualification

Additional grant programs to upgrade facilities and equipment or to change the function of a facility have been made available on a periodic basis. The Building Quality Restoration Program has supported specific equipment upgrading in industrial education, home economics and business education in the past ten years. These funds were available on the basis that the government grant matched the amount provided by the school jurisdiction. Between 1978 and 1981 $12 million was transferred to school jurisdictions towards the purchase of equipment for industrial education and home economics facilities. Thirty million dollars was provided to school jurisdictions between 1984 and 1986 for upgrading business education equipment in high school and computers in Grades 1 - 9.

*Building Quality Restoration Programs*
*(Equipment Upgrading)*
*(Alberta Education Portion 50%)*

| | | |
|---|---|---|
| *Industrial Education and Home Economics* | | |
| 1978-81 | $12,000,000 | Gr. 7-12 |
| *Business Education/Computers* | | |
| 1984-86 | $13,099,675 | Gr. 1-9 |
| | $17,175,922 | Gr. 10-12 |
| | $30,275,597 | |

Many local school boards implement upgrading programs as a result of community initiatives and school program priorities, whether or not matching funds are available from government grant programs. School jurisdictions can also access government support for the purchase of approved industrial education and business education equipment, depending on local conditions and available funds. Provincial support for new school buildings can range from approximately 70 to 95 percent and at the secondary level often include specially designed practical arts facilities. The amount of support for practical arts equipment purchase and building programs has varied significantly over the past five years. In that time 13 new secondary schools have been built and 40 schools have been upgraded.

*Vocational/Industrial Education Equipment Support*

| | Tender Amounts | No. of Schools |
|---|---|---|
| 1985 | $318,081 | 5 |
| 1986 | $1,435,655 | 3 |
| 1987 | $25,000 | 1 |
| 1988* | $193,096 | 2 |
| 1989* | $443,656 | 2 |

* to April 1989

## Fees

Superintendents believe that some practical arts courses are more expensive to offer than other core or elective courses because of equipment and materials needed and because class sizes may be smaller. All jurisdictions provide some extra resources for school budgets where industrial education and

home economics courses are taught. A computerized costing program by Alberta Education is available to school jurisdictions to help calculate operational costs for the practical arts programs.

Students are required to pay a fee for enrollment in home economics and industrial education courses in almost all schools. This fee is designed to offset some of the costs of materials used by students in doing practical work required by the course. In some courses, funds are obtained through the provision of services (e.g., beauty culture, automotives, building construction). There is variation in the size of fee across the province, but $10.00 is an average amount. Students also pay for large projects which they take home for personal use. Efforts are made to keep student fees and charges to a minimum, and school officials will often provide funds to individual students who need such assistance. Neither school superintendents nor students surveyed believe that the costs of practical arts programs are preventing students from enrolling.

*Confirmed by school superintendents contacted by Alberta Education and by Calgary Board of Education rEsearch, 1988-89.*

Contracts between school jurisdictions to allow students to take a practical arts course in another jurisdiction specify fees from $250 to $700 per student enrollment. Such contracts tend to be for junior or senior high industrial education or home economics courses, as all high schools have the facility to offer some of the business education courses. No special funding provisions are made for student education contracts where work experience and business education courses are involved.

The variability in funding to support practical arts facilities and equipment is a concern for many superintendents. The establishment of an 'evergreen' or continuous support for capital funding from Alberta Education is seen as an essential step to the effective maintenance and management of the present investment base.

## FACILITIES FOR TEACHING PRACTICAL ARTS COURSES

Almost all junior and senior high schools contain specialized laboratories and classrooms for delivering some practical arts courses. Facilities for courses in business education, industrial education, and home economics are the most widely available in Alberta secondary schools.

Specialized facilities for industrial education - career areas often require sophisticated equipment and special building adaptations such as ventilation exhaust systems to satisfy health and safety considerations. These facilities are found where the school population is large enough to support such a major investment. Funding is available as part of the Building Quality Restoration Programs or the New School Capital Construction Equipment Grants for new construction, modernization, upgrades to meet requirements of Alberta

*Alberta Education School Buildings Branch requirements suggests 650 students as a minimum enrollment to be eligible for funding of specialized facilities for teaching industrial education - careers courses.*

Occupational Health and Safety and change of function for facilities used to teach practical arts courses. These grants are negotiated with the School Buildings Branch of Alberta Education. The amount of support depends on a complex set of factors including the size of school, utilization of existing facilities, the taxbase of the jurisdiction and the budget available from government at the time of application.

In rural areas, where schools may be too small to warrant building special facilities, school jurisdictions may arrange to transport students to a different location for specific programs. At the high school level, school jurisdictions may arrange tuition agreements so that individual students can obtain the practical arts program they desire in a neighboring jurisdiction.

## DISTANCE EDUCATION DELIVERY

A number of rural school jurisdictions use a combination of correspondence materials, travelling teachers and community worksites to provide opportunities for students to access practical arts courses.

Two recent Alberta Education initiatives have focused on improving access to specialized courses for students in small high schools. The Distance Education North Project concentrates on the development of computer based instructional units that can be used by individuals or small groups of students in isolated school settings. A numb of business education courses in this medium have been developed for the project. In southern Alberta, 13 schools in 11 school jurisdictions started the 1987-88 school year as part of the Distance Learning in Small Schools Project (DLSS). Schools initially involved in this project were provided with support for facsimile machines and teacher tutors to assist in delivering high school courses. Students in these schools were able to select from twice as many courses as they could in school years prior to implementation of the DLSS project, although the increase in the actual number of courses taken by students averaged about 33%. In its second year, the DLSS project has doubled to include twenty eight schools. The initial evaluations by all stakeholders are very positive.

*Projects begin in 1987-88 (check name)*
*Appendix 4 - Distance Learning in Small Schools facts and figures.*
*Evaluation of Phase I of the Distance Learning in Small Schools Project. Alberta Education. October 31, 1988.*

A major change in delivery systems, particularly in small schools, is the inclusion of more distance education and Alberta Correspondence School materials as an alternative to traditional classroom presentation methods. These materials are used as a delivery system and also as a support resource for teachers. School superintendents in rural jurisdictions report increased use of correspondence materials in delivering practical arts courses.

*Alberta Correspondence School course registrations in 1988 indicated that more than one quarter of the total ACS registrations from students in school were in practical arts courses.*

Administrators in predominantly rural jurisdictions were positive towards new government initiatives regarding distance education. A number of superintendents were actively establishing networks for the delivery of distance education programs and anticipating the expansion of course offerings in the practical arts and other areas in smaller high schools.

## PREPARATION AND INSERVICE OF PRACTICAL ARTS TEACHERS

Alberta teachers as a group have an average of 4.6 years of university training, 13 years of teaching experience, and all hold a provincial teaching certificate. The average age of teachers has increased by several years since 1981. Teachers in the practical arts conform to this profile in terms of university training and teaching experience, although many business education and industrial education teachers are somewhat older than the average because they bring some years of work experience to their teaching careers.

*Alberta Education Facts and Figures - 1988*

The supply of teachers for practical arts programs appears to be adequate at this time, based on the fact that very few school superintendents in the sample contacted identified the lack of qualified teachers as a factor in providing practical arts courses. Some practical arts teachers are being required to teach in courses outside of practical arts as course offerings are reduced or dropped from school programs. Some practical arts teachers instruct in two schools. However, there is some concern from superintendents that there may be a shortage of trained, practical arts teachers in the future.

Specialized undergraduate and graduate programs for practical arts teachers are available at the University of Alberta (Faculty of Secondary Education and Industrial and Vocational Education) and the University of Lethbridge.

Grant programs for the recruitment and training of teachers in industrial education and business education began in the 1960's with the Vocational Teacher Development Grant. This grant provides support up to $22,000 (1989) for two years of university training towards teacher certification. To be eligible, an applicant must have an Alberta Journeyman's Certificate or equivalent, acceptable industrial or business experience, residency in Alberta and approval from a selection committee. Over 600 teachers have been provided with support through this grant over the past 25 years. The total amount expended for this grant program has been $4,372,840. This year, 1989, there are only four individuals funded under the Vocational Teacher Development Grant.

Inservice and support for teachers in the practical arts is accomplished through arrangements very similar to those available for all classroom teachers as well as through some

innovative projects. Urban school districts generally supply expert consultancy and curriculum support to these specific subject areas. Rural and small school districts make somewhat more use of the consultancy services of Alberta Education Regional Offices, the Alberta Teachers' Association specialist councils and joint teacher institutes involving several neighboring school areas. Because of the need for currency in technological fields that are changing rapidly, many practical arts teachers are involved in personal upgrading programs through technical institutes and colleges and through business and industry such as workshops sponsored by suppliers in the computer or automotive fields.

## ENROLLMENTS IN PRACTICAL ARTS PROGRAMS

Four considerations affect patterns of enrollment in practical arts: access to facilities, school timetables, student and parental goals and expectations, and Alberta Education requirements.

*There are approximately 33,000 students in each grade level.*

*Junior High - 100,000*

*Senior High - 100,000*

### JUNIOR HIGH SCHOOL ENROLLMENTS

Most junior high students in the province take at least some courses in the practical arts. In smaller schools it is often the practice to have all students take industrial education, home economics, typewriting or computer literacy as a 'required' option. This is also the case in larger schools which require these courses as a result of local school decision-making.

***Junior High School***
***Practical Arts Enrollments 1987-88***

| | 7 | 8 | 9 |
|---|---|---|---|
| Total Grade Enrollments | 34,432 | 33,513 | 32,427 |
| Agriculture | 912 | 578 | 608 |
| % Total Enrol. | 3% | 2% | 2% |
| Computer Lit. *8 | | 30,369 | |
| % Total Enrol. | | 91% | |
| Home Economics | 12,441 | 16,489 | 15,468 |
| % Total Enrol. | 36% | 49% | 48% |
| Industrial Education | 11,914 | 15,809 | 15,846 |
| % Total Enrol. | 35% | 47% | 49% |
| Typewriting *9 | | | 9,793 |
| % Total Enrol. | | | 30% |

*may be taught in Grades 7, 8, or 9.

Although the programs of study are designed for 75 hours of instruction, there is considerable range in the number of hours junior high schools allocate to these courses in the timetables (35 - 100 hours).

Traditionally, home economics and industrial education were often identified as girls' or boys' courses. Today, there appears to be less sex stereotyping in junior high practical arts courses, and schools which mandate these programs often require that both boys and girls enroll in both home economics and industrial education. As one example, the Calgary Board of Education reports that about one half of all junior high students enroll in industrial education at the junior high level, and the female portion of these students has grown from 15% to 34% of the total over the past 10 years.

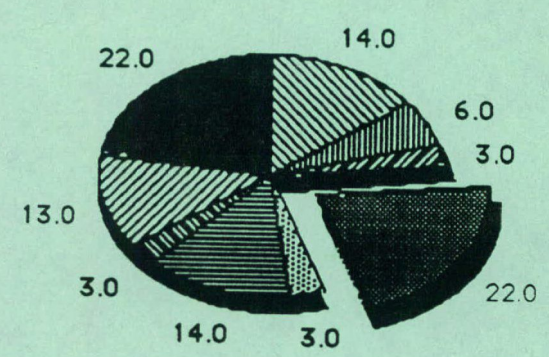
*Calgary Board of Education. Technology and Life Skills: Complementary Programs for the Twenty-First Century. Task Force Report. March 1989.*

## SENIOR HIGH SCHOOL ENROLLMENTS

In senior high schools, patterns of enrollment in the practical arts vary somewhat among the areas of the province, between female and male students, and between students challenging an Advanced High School Diploma and a General High School Diploma.

Practical arts is the most commonly taught complementary program in the high school program.

Senior High Enrollments*
Average of 1985-86, 1986-87, 1987-88




AVERAGE

*Social Studies 14%*
*Physical Education - 6%*
*Fine Arts - 3%*
*Practical Arts - 22%*
*Other - 3%*
*Language Arts -14%*
*Second Languages -3%*
*Math - 13 %*
*Science - 22%*

*Enrollment is used to indicate the number of students taking a course. Credit enrollment unit (CEU) relates those enrollments to the number of credits designated for the course (e.g., 20 students enrollments x 3-credit courses = 60 CEU's).. CEU's provide a more accurate indication of demands on facility and teacher allocation.*

If each practical arts program area is taken as an entire group, student enrollments in every area have fallen in the past few years although there are some courses recording growth and some recording declines.

*includes related locally developed course enrollments

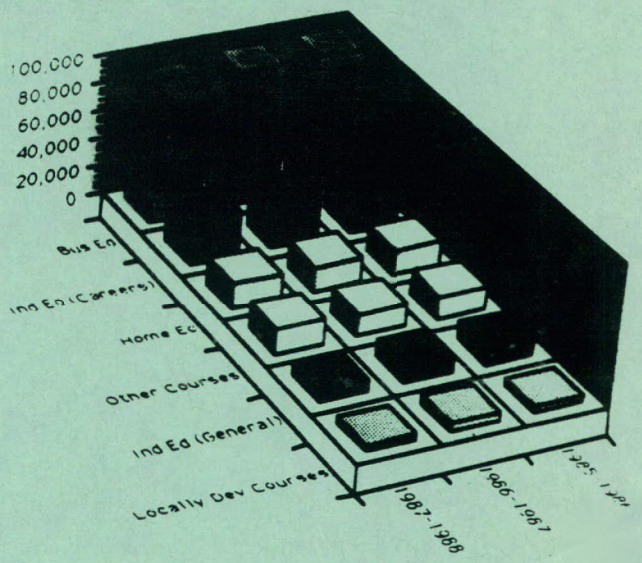
Since these are complementary courses, schools choose to offer and students choose to enroll in them for many different reasons including career expectations, diploma requirements and traditional registration patterns.

*Although the enrollment patterns overall are quite balanced, certain practical arts courses, particularly in the senior level courses are typically taken by boys, others by girls*

*Appendix 3 outlines enrollment patterns for each senior high school course*

**Senior High School Practical Arts Enrollment Changes**

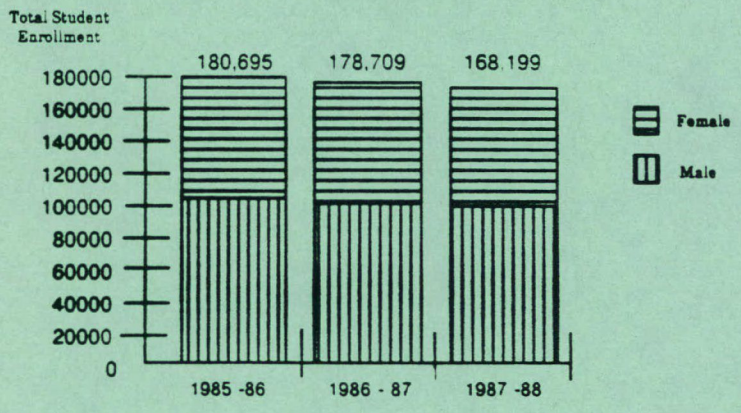
| | 1985-86 | 1987-88 | % Changed |
|---|---|---|---|
| Agriculture | 162 | 91 | -44 |
| Business Education | 101,731 | 94,581 | -7 |
| Home Economics | 18,317 | 18,238 | -0.04 |
| Industrial Education | | | |
| - General | 11,964 | 10,036 | -16 |
| - Careers | 37,262 | 34,532 | -7 |
| Work Experience | 10,436 | 10,172 | -3 |




Most of the practical arts courses designate one or more courses as prerequisite to senior level courses. It is typical to see substantial decrease from the 10-level enrollments to the 20- and 30-level enrollments. With fewer students taking senior level courses, many schools find it difficult to timetable a full 10-20-30 course sequence.

There is no apparent shift in the patterns of enrollment for male and female students over the past three years.

**Total Number of Student Enrollments in Practical Arts**




| | 1985-86 | 1986-87 | 1987-88 |
|---|---|---|---|
| *Female* | 50% | 50% | 50% |
| *Male* | 50% | 50% | 50% |

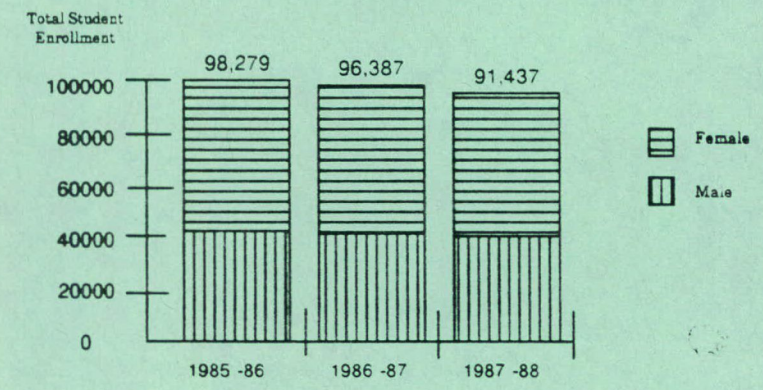
Several high school practical arts courses attract a large number of students. In the 1987/88 school year, almost two thirds of all high school student enrolled in Typewriting 10, about 40% in Accounting 10 and Computer Processing 10 and about 20% in Food Studies 10, Accounting 20 and Law 20. A general decrease in enrollment since 1985/86 can be seen in all these courses except Accounting 20.

**% of High School Students Enrolled**

| | 1985-86 | 1987-88 |
|---|---|---|
| *Typewriting 10* | 72% | 65% |
| *Comp. Processing 10* | 43% | 40% |
| *Accounting 10* | 39% | 39% |
| *Food Studies 10* | 22% | 20% |
| *Accounting 20* | 20% | 21% |
| *Typewriting 20* | 21% | 19% |

Within the business education program, enrollments are declining, particularly in Typewriting 10 and Computer Processing 10 which have traditionally been taken by a large proportion of high school students. Educators suggest this decrease is partly due to the increasing numbers of high school students already have basic typewriting and computer skills from junior high school courses.

**Total Number of Student Enrollments in Business Education**

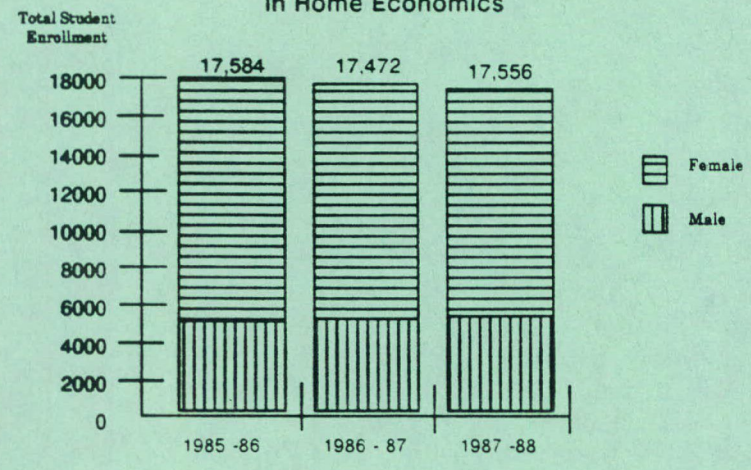



**Proportion of Male/Female Enrollments**

| | 1985-86 | 1986-87 | 1987-88 |
|---|---|---|---|
| *Female* | 58% | 58% | 58% |
| *Male* | 42% | 42% | 42% |

Within the home economics program, student enrollments in food studies and clothing and textiles areas are declining, but enrollment in personal living skills courses is showing a slight increase.

**Total Number of Student Enrollments in Home Economics**

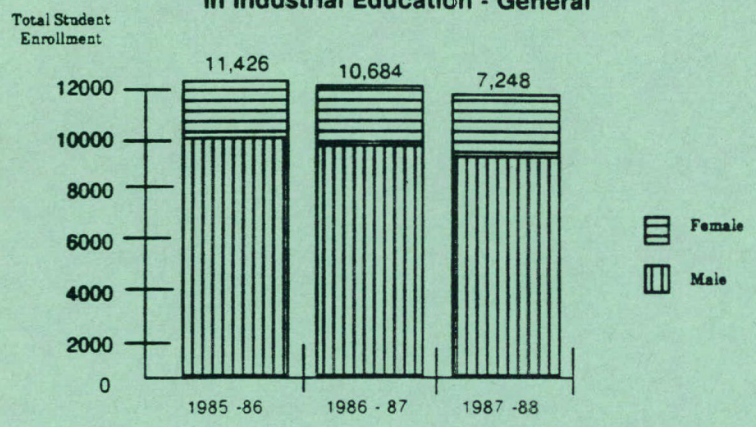



**Proportion of Male/Female Enrollments**

| | 1985-86 | 1986-87 | 1987-88 |
|---|---|---|---|
| *Female* | 71% | 69% | 68% |
| *Male* | 29% | 31% | 32% |

The Industrial Education - General enrollments have declined during the last three years. The decline is greatest between 1986-87 and 1987-88 school years.

**Total Number of Student Enrollments in Industrial Education - General**

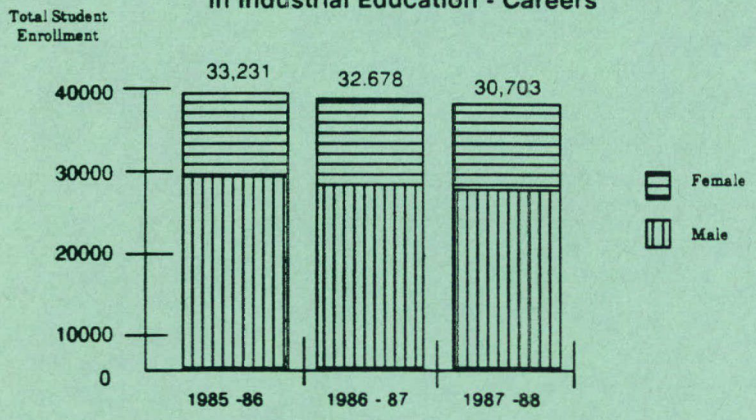



***Proportion of Male/Female Enrollments***

| | *1985-86* | *1986-87* | *1987-88* |
|---|---|---|---|
| *Female* | *15%* | *15%* | *15%* |
| *Male* | *85%* | *85%* | *85%* |

In the total Industrial Education - Careers program there is a small decline in enrollments in the past three years. However, some courses have experienced a substantial decline in enrollments.

**Total Number of Student Enrollments in Industrial Education - Careers**




***Proportion of Male/Female Enrollments***

| | *1985-86* | *1986-87* | *1987-88* |
|---|---|---|---|
| *Female* | *27%* | *28%* | *28%* |
| *Male* | *73%* | *72%* | *72%* |

## Student Access to Program Facilities

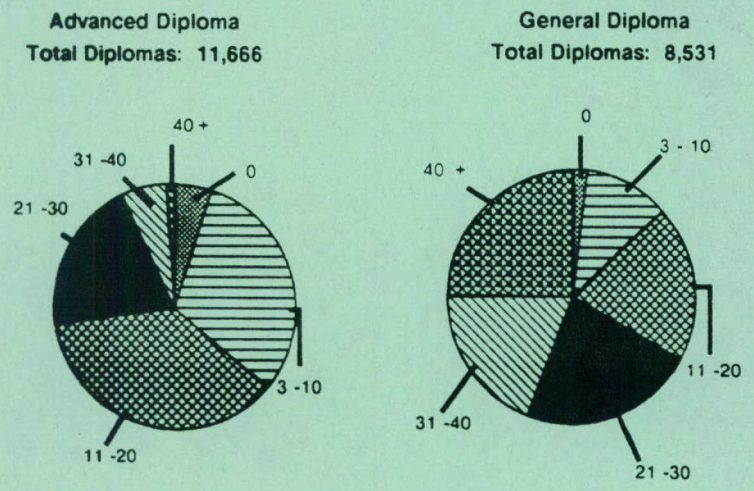
There is considerable variation of student enrollment patterns in practical arts courses among the various geographical areas of the province. Some differences, however, are quite consistent, between smaller and larger highschool student populations. Proportionally, students in smaller high schools enroll in more credits in Business Education, Home Economics, Industrial Education - General and Work school student . Proportionally, students in smaller high schools enroll in more

credits in Business Education, Home Economics, Industrial Education - General and Work Experience than students in larger high schools. As school size increases, the percentage of students enrolled in these Practical Arts courses declines. Conversely, the proportion of students enrolled in Industrial Education - Career courses varies directly with high school size. A very low percentage of students are enrolled in career preparation in high schools with fewer than 800 students. Clearly, access to programs in urban and large consolidated rural high schools provides an opportunity for enrollment in these programs that is generally unavailable to small rural schools.

## Changing Goals and Expectations

There is substantial interest in practical arts shown by students achieving both General and Advanced High School Diplomas. The pattern of course enrollment in the practical arts within each diploma group has remained relatively constant over the period of 1985-86 to 1987-88: more than 68% of all students receiving a General High School Diploma and about 55% of all students receiving an Advanced High School Diploma earn at least 10 credits in practical arts.

**Percentage of students receiving practical arts course credits on Advanced and General High School Diplomas for School Year 1987-88.**



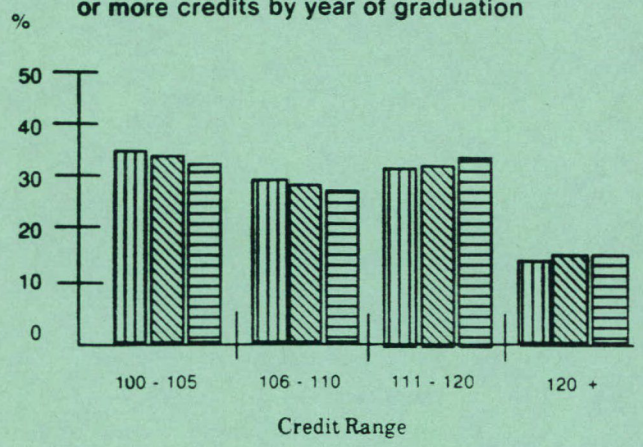

| No. of Credits | General Diploma | Advanced Diploma |
|---|---|---|
| 0 | 2% | 5% |
| 3-10 | 11% | 31% |
| 11-20 | 20% | 37% |
| 21-30 | 23% | 20% |
| 31-40 | 19% | 6% |
| 40 + | 25% | 1% |

*Note: These percentages were essentially the same in 1985-86 and 1986-87.*

Since 1984, the province of Alberta has awarded two distinct high school diplomas, an Advanced High School Diploma and a General High School Diploma, both requiring minimum 100 credits. At that time province-wide Grade 12 examinations were established.

Between 1985 and 1988 students who attained high school diplomas typically had more than 100 high school credits. Seventy percent of students receiving a high school diploma in 1988 had successfully completed more than 105 credits of course work: forty-five percent had more than 110 credits.

**Percentage of students with a 100 or more credits by year of graduation**

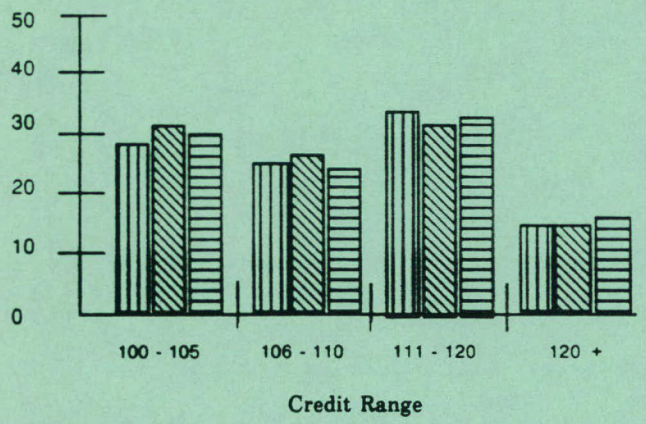



***How many credits do students have when they receive their first high school diploma?***

*1985 - 86 over 67% have 106 + credits*
*1986 - 87 over 67% have 106 + credits*
*1987 - 88 over 67% have 106 + credits*

This proportion has been essentially stable since 1986, and is representative of students from all schools in the province.

**Percentage of students who take more than 100 credits in school of various sizes 1987 - 88 School year**




***Students in High School***

0 - 300
301 - 800
800 +

Approximately 80% of the students receiving a high school diploma do so within three years of entering high school: about 8% receive a diploma within four years, and a further 12% receive a diploma in five or more years. This pattern seems to vary between rural and urban areas, with rural areas indicating a much higher percentage of students completing within three years. This would seem to reflect the access to more varied and extensive programs in the urban setting.

**Years in High School to Attain First High School Diploma**

**1987-88 School Year**

| Zone* | 3 years to graduation | more than 3 years to graduation |
|---|---|---|
| 1 | 90% | 10% |
| 2 | 85% | 15% |
| 3 | 76% | 24% |
| 4 | 85% | 15% |
| 5 | 78% | 22% |
| 6 | 89% | 11% |

*Zones 1, 2, 4 and 6 have school populations from predominantly rural areas. Zones 3 and 5 have school populations resident largely in Edmonton and Calgary.*

More students are attempting to earn an Advanced High School Diploma. The proportion of high school graduates receiving General and Advanced High School Diplomas has shifted substantially over the past three years. In the spring of 1986, 47% of graduates received general diplomas and 53% received advanced diplomas; in 1988, 42% of graduates received general diplomas and 58% received advanced diplomas. School system personnel report that a substantially higher proportion of Grade 10 students are registering in courses which could lead to an advanced diploma (60-75%).

A decrease in enrollments in the practical arts courses may reflect a change in post high school expectations of high school students. The opportunities for entry into the work force have changed significantly over the past five years. The unemployment rate of young people aged 15-19 has been above 16 percent since 1982. More students either intend to enroll in post secondary programs and/or many parents and students believe that the Advanced High School Diploma provides a better preparation or credential for post high school success.

*Alberta Education: Facts and Figures 1988*

At the present time, no Alberta University or post-secondary institution requires an Advanced High School Diploma for admission. Several institutions require either one of the high school diplomas, and universities generally require a complement of courses specific to a particular faculty.

Estimates are that from 40% to 75% of students move from high school directly into the workforce. The percentages vary depending on location and access to post-secondary institutions. Alberta Education statistics indicate that more students are entering post-secondary institutions than in past years.

More high school students are staying in school longer or returning to school to complete preparation they see as required in a competitive job market. From 1970 to 1980, the number of Grade 12 students represented a constant 90% of the number of students enrolled in Grade 9 three years previously. In 1987-88, this percentage increased to 112%, or, 12% more students were in Grade 12 than were in Grade 9 three years before. The increase in returning Grade 12 students provides new challenges for school program planning and timetables.

A planned change in the course requirements for these two diplomas is being implemented in high schools from 1988-89 to 1991-92 school years. These changes will increase the specified courses required for a diploma by about 30 percent for each diploma. No change is being made to the 100 credit requirement for attaining either high school diploma.

For many students the increase in the number of specified credits has had the effect of reducing the time available within the 100 credits for complementary courses such as those in the practical arts. Beginning in 1990, students planning to complete an advanced diploma must enroll in 76 specified credits. Of those 76 credits, 10 credits may be in an approved course sequence in practical arts. Those planning a general diploma must enroll in 62 specified credits. Students taking a French Language program and those enrolled in Roman Catholic Schools where religion is a required course may have up to 95 required credits.

## INNOVATIVE PRACTICAL ARTS PROGRAMS IN ALBERTA

The practical arts programs in Alberta have been responsive to changes affecting industrial, social and school conditions, and dozens of local initiatives have resulted. At the senior high school, innovative programs in the practical arts are having an impact on all aspects of program content, delivery, and support. For the purposes of this report, a sampling of current innovative programs has been selected to represent three dimensions of innovation in meeting student needs: adaptations to the curriculum; the use of various new delivery systems; and, the establishment of community partnerships.

### CURRICULUM ADAPTATIONS

Through the flexibility inherent in provincially developed practical arts curricula and by developing courses locally, schools are able to adapt or develop curricula to meet local student needs. School programs in business education, home economics and industrial education are adapted by the use of

elective and locally developed curricular material, by a variety of credits available (3, 4, 5, 10, 15 in many cases), and by accommodating different projects and activities to suit individual students and resources available.

A provincially sponsored new curriculum, Industrial Physics 12, 22, 32 (Principles of Technology 10, 20, 30), is being piloted in four high schools in Alberta. This series of courses was designed by a consortium of educators in the United States and Alberta as a exploration and preparation of workers for technological career fields. Now in its third year of piloting, the course is proving to be of interest to students who may be headed towards further study in engineering, physics or towards the workplace in the operation of technologically complex systems.

*Schools involved in piloting Principles of Technology*

- *Victoria Composite High School, Edmonton*
- *Ernest Manning High School, Calgary*
- *Lethbridge Collegiate Institute, Lethbridge*
- *Ardrossan Junior-Senior High School, County of Strathcona*

A curriculum adaptation used in a number of school jurisdictions is the Practical Arts 15A and 15B course structure. This locally developed course structure is designed to allow schools to present 5 credit courses which may contain modules from any of the practical arts course areas. This structure encourages students to explore more course areas than they could using traditional industrial education 12, 22, 32 courses.

Several school jurisdictions are responding to a need in the community for specific kinds of vocational training by developing local programs, often in conjunction with community colleges or other interested community members. Related Mechanics 12, 22, 32 is being offered in an Experi tial Learning and Instruction for Trades Entry (ELITE) program in Grande Cache. This program involves trade exploration and preparation for students via school and community facilities. Entrepreneurship and Farm Trades courses being planned in Vermilion use the resources of the community and Lakeland College. An integrated program linking core and complementary curriculum, community service and entrepreneurship is underway in Olds High School. A new locally developed course, High Technology 15, 25,35 developed by the County of Leduc includes topics from electronics, fluidics, computer drafting and lasers.

## DELIVERY SYSTEM CHANGES

Another dimension of the adaptations schools are making in practical arts courses is change in assessing student performance and the use of new technologies in delivering programs.

New concepts currently employed in a number of practical arts courses are student managed learning and competency based instruction. The student managed learning concepts promote a transfer of some or all of the classroom management processes from the control of the teacher to the control of the students. Once familiarized with the goals, expectations and procedures in the course, students can proceed at their own pace through subject content, and teachers can spend more time with learners who may be having difficulties with the content. Adaptations of this concept are found to some degree in a large number of courses with a modular structure and individualized projects. A thorough implementation of the student managed learning can be seen in some food preparation, home economics and business education courses in the province.

*Examples of Student Managed Learning Situations:*

*Forest Lawn High School Food Preparation.*
*Calgary Board of Education*

*Bonnie Doon High School Business Education.*
*Edmonton Public School Board*

*Bishop Carroll, Calgary Catholic Separate School District*

Competency based programs and programs using some degree of advancement based on competency are widely spread through the practical arts course areas. A three year pilot project in the Calgary Board of Education high schools "Advancement Based on Competency" demonstrated acceptable achievement of provincial and school system expectations. The project, which included courses in the practical arts, is expected to continue and expand.

*The "Advancement Based on Competency" project was evaluated in 1987 under government contract*

## COMMUNITY PARTNERSHIPS

Many schools and school jurisdictions are responding to student needs through partnerships with the school community.

School jurisdictions are implementing or planning a variety of off-campus programs to accommodate the delivery of industrial education courses. Programs are now in place in the County of Mountain View for the delivery of Mechanics 12 and Automotives 22 and 32; in Vermilion Roman Catholic Separate School District and County of Vermilion for the delivery of Food Preparation 12, 22 and 32; in the County of Athabasca for delivery of Automotives 12, 22 and 32; and in the Acadia School Division for Automotives 12, 22 and 32. In each case the programs are unique to that location, utilize resources from local businesses, and involve a coordinating teacher. Learning materials may be provided by the Alberta Correspondence School, and journeyman tradespeople may be employed by the school board or local businesses. In some cases, Alberta Education has provided a certain amount of funding for tools and the upgrading of facilities. In all cases, Alberta Education personnel, community businesses, and resource people have been closely involved with the schools in the development and ongoing assessment of the programs.

*For example, Mountain View School Division is providing Mechanics 12 and Automotives 22/32 for 91 students via classroom instruction, correspondence materials and community worksites.*

*A number of school systems share resources with Alberta Vocational Centres and colleges (Fairview, Lac La Biche).*

Another form of community partnership is the coordination of programs provided jointly by two or more school jurisdictions. Where the number of high school students is small, as in several Roman Catholic Separate school districts, the jurisdiction may negotiate tuition agreements to allow students to attend a larger, public district high school nearby. Whitecourt Public and Separate School Districts are negotiating to build a high school as a jointly owned facility. Other programming alternatives in place are the specialization of designated schools. For example, one school may offer a business education program while another will provide industrial education and home economics programs.

*Stettler School*

The development of innovative responses in delivering practical arts programs to students demonstrates leadership provided by jurisdictions, teachers, government and the community and reflects support for the programs.

## CONCLUSION

Practical arts programs in Alberta schools offer a broad spectrum of learning experiences for students from Grades 7 to 12. Support for practical arts courses can be seen in the commitment of large, small, urban and rural schools to providing students with the opportunity to enroll in courses from all of the program areas in practical arts. In certain circumstances, this access to courses must be provided through unusual and innovative means.

Students needs and the needs of our society are changing constantly, and schools are challenged to respond to these changes. The programs offered through the practical arts provide a vehicle to connect young people directly to the life of families and the workplace into which many of them will move directly after high school. The creativity and commitment represented by the innovative projects developed to deliver practical arts programs throughout this province are a statement of confidence in their value to Alberta students.

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## Appendix 1: Summary of School Superintendent Survey Results


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# Summary of School Superintendent Survey Results

*Twenty-five school superintendents were interviewed by telephone about the practical arts programs in their jurisdictions. Questions discussed included current patterns of enrollments, factors affecting the offering of or enrollment in courses, program costs, innovative projects, and the concerns and future plans of the local boards and senior administrators. A further ten leading administrators were contacted regarding specific innovative projects either in the planning stages or in operation within local schools. Information from these sources has been compiled to complement the statistical information provided by Alberta Education records.*

## Status of Practical Arts Programs

All schools offered some practical arts courses at the junior high level, although four small schools, because of lack of facilities, sent students to a neighboring jurisdiction for these programs. In forty percent of schools, one or more courses in business education, home economics, or industrial education were compulsory for all junior high students, while in the remainder of them courses were selected from a number of complementary courses.

At the senior high level, some course offerings in business education, home economics, industrial education-general and work experience are found in more than 80% of the high schools in the jurisdictions surveyed. In the industrial education-career areas, the variation is from "none at all" to a large variety of courses within a school district and among various school jurisdictions. In a school jurisdiction with a number of high schools, some high schools offer a wide range of industrial education-career areas and some concentrate on offering academic courses, perhaps with a limited variety of complementary programs in practical arts, fine arts and second languages.

Rural jurisdictions with only one high school may offer a range of industrial education courses, often utilizing innovative combinations of community and school resources to accommodate the specific program needs. From the sample surveyed, it appears that there is a growth in the number of small schools offering more Industrial Education courses, particularly courses such as mechanics, food preparation and building construction. On the other hand, larger schools appear to be reducing the number of industrial education courses they offer, particularly in areas such as piping, autobody and electricity/electronics.

## Enrollment Trends

In the sample of school jurisdictions contacted, 45% reported that the number of high school students in their district was increasing, 30% reported steady enrollments and 25% reported dropping enrollments.

Jurisdiction administrators surveyed reported that enrollments were holding or decreasing in home economics and industrial education course areas. Some growth and some decline was experienced in business education course enrollments. Work experience course enrollments were reported as holding or increasing. Some administrators suggested that this increase was replacing enrollments in Industrial education areas, and several suggested that the increased enrollment reflected the intention of students to use the course for entry into part or full-time employment.

A few school jurisdictions were adding or planning to add new courses in practical arts at the high school level. Computer processing was being added in three locations, assisted by the installation of new computers. Industrial Education 10-20-30 courses were being introduced in several locations, accompanied by some school facility development and use of community partnership. Several new programs were in the planning stages, involving the use of resources from schools, local community colleges, and community businesses. These new courses included marketing, entrepreneurship, developing small business and agricultural mechanics.

The larger school jurisdictions, those with over 1000 high school students, reported no plans for new courses in the practical arts. Almost unanimously, these jurisdictions were experiencing lower enrollments in business education, home economics, and industrial education, and increased enrollments in work experience courses.

Factors Affecting Practical Arts Enrollment

The two most important factors identified by school superintendents as causing declining enrollments or the deletion of courses in the practical arts are changes in student graduation requirements and a philosophical shift from vocational to academic education.

Threequarters of the superintendents contacted believe that changing graduation requirements are causing decreases in practical arts course areas. They used the term "credit crunch", referring to the pressures students are under to complete all the courses currently required for an Advanced High School Diploma. A larger percentage of students are seen to be attempting an advanced diploma, as students and parents perceive that this diploma provides an advantage in both employment and entrance to post-secondary institutions. Another aspect of graduation requirements are the increasing grades required of graduates for entry into either universities or technical institutes. Students appear to be focusing on getting higher marks, sometimes by limiting the number of complementary courses and replacing these with study periods. A large percentage of high school students, estimates range from 30% to 60%, are involved in part-time employment during the school year. These students may also reduce their involvement in complementary/optional courses because of their out of school time commitments.

Alberta statistics indicated that students over the past three years are taking about the same number of credits towards a high school diploma, and spending about the same number of years in high school. If these factors remain constant, while more students obtain advanced and general diplomas, there would be an expected decrease in complementary course enrollments of about 30%, equal to the increase in specified credits required in the revised diploma requirements (implemented in 1989-90). A Calgary Board of Education study of two thousand students provides statistics to support the claim that currently enrolled (1988-89) students plan to enroll in considerably fewer complementary courses than their peers a few years previously.

About half of the superintendents considered that government and public sentiment has shifted in philosophy away from vocational education. The remainder were divided between active development of vocational education programs to serve local community needs or continuing to focus on academic education. In the case of this latter group, all smaller school jurisdictions, there was a staunch defence of excellent academic preparation coupled with a recognition that small schools lacked resources to provide an extensive variety of complementary programs.

About one-quarter of those contacted suggested that declining district enrollments, or the inability to keep up with new technology were having a noticeable impact on enrollments in the practical arts. The majority of superintendents did not feel these were significant to the enrollment declines.

Few superintendents identified the availability of qualified staff, costs of the program to students or the lack of jobs for student graduates as having an impact on Practical Arts course enrollments. In discussing the issue of staffing, superintendents were not currently experiencing problems hiring qualified teachers. A number of superintendents expressed concern that fewer applications were being received for any particular practical arts position and that a shortage of trained teachers might occur in the near future. As enrollments in specific practical arts courses fall, these teachers may be required to teach other courses in the school. However, few jurisdictions assign to courses teachers who do not have appropriate practical arts background.

In response to declining enrollments, the majority of jurisdictions try to maintain course offerings for students by combining classes to offer lower enrollment courses, offering fewer sections of a course, or cycling courses so they are offered every two or three years. More than one third of the respondents noted that they have closed or remodelled practical arts facilities for other uses. About half of the rural jurisdictions surveyed are experiencing an increase in students taking practical arts through the Alberta Correspondence School.

Support for Programs

School superintendents believe that home economics and industrial education courses are more expensive to offer than most others offered in their secondary schools. Estimates of the actual additional school costs ranged from $150 per course enrollment to $700 per student which was the amount paid to another school for delivery of a particular program. However, no jurisdiction contacted had completed a full cost analysis of practical arts courses.

All jurisdictions recognized the extra costs of delivering practical arts courses by providing schools with extra staff, capital funding, supply allotments or per pupil materials costs. All but four school districts contacted charged some fee for basic supplies used up by students. Fees were as low as $5 per course but most were around $10; some up to $25. Students generally paid the full cost of projects they took home, but no students appeared to be denied access to any program on the basis of inability to pay.

All of the urban jurisdictions, but only one third of the rural jurisdictions received Vocational Education Grants. [Almost all of the jurisdictions who offered the industrial education courses received grants in support of them. The few exceptions noted that there were deficiencies in the qualifications of the teacher and that disqualified them.]

All jurisdictions had taken advantage of Special Building Quality Restoration Program grants if they were eligible. About half of the superintendents expressed the concern that the variability of funding caused financial pressures to the jurisdictions. A constant or 'evergreen' system to maintain facilities and equipment was recommended as an appropriate system for schools.

Coordination and Leadership in the Practical Arts

The larger urban school systems employ administrative or curriculum specialists in the practical arts areas. Smaller jurisdictions depend on the superintendent and principals to coordinate these programs. As a result, rural school jurisdictions tend to depend more on support from Alberta Education Branches, professional development activities sponsored by the Alberta Teachers' Association, and leadership activities initiated by local principals or groups of teachers. Several boards reported innovative teacher inservice programs using the resources of community colleges, institutes of technology, and industrial dealerships (IBM, Apple Computers, General Motors).

Half of the superintendents surveyed expressed a desire for stronger leadership from Alberta Education in practical arts programs. The new high school graduation requirements are seen to be a statement of increased support for academic programs and consequently, decreased support for complementary programs. Several rural school districts and most of the urban districts have sent written presentations to Alberta Education expressing the concern that the changed graduation requirements may effect changes that will not address the needs of the majority of high school students who will go directly from school into the workplace. They were concerned that as more students set their sights on obtaining an advanced diploma, schools will continue to reduce course offerings in the practical arts, and eventually close down program areas that once accommodated students who were university bound and wanted life skills and career exploration, as well as students who were preparing to enter the workplace directly out of school.

Referring to students who are frustrated with academic courses in the high school, one superintendent questioned: "Where are these students to go? Where will they learn to find satisfaction and to gain confidence from a job well done if we can't keep these (i.e., practical arts) programs in our schools? I worry for them." Most school boards and superintendents are committed to a broad offering of programs at the high school, but are seeing a trend towards increased focus on the academic. Some say the trend is just beginning to show and the next few years will mark a larger shift in enrollment away from the practical arts. These superintendents worry that high school dropout rates will rise rapidly if school programs are not perceived to be relevant to life after school, and are encouraging counselling and the development of new programs to attract and hold the potential dropout. These programs generally incorporate vocational and life skill development with core academic programming.

One third of the superintendents surveyed reported that the school board they represented was not concerned with dropping practical arts enrollments. These boards were comfortable that schools would continue to offer a necessary breadth of courses but could focus on doing a better job in the academic areas if their resources were not stretched to offer a wide range of courses. They also were looking forward to advances in distance education to provide some of the complementary courses desired by students.

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## Appendix 2: Description of Practical Arts Courses


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# DESCRIPTION OF PRACTICAL ARTS COURSES

## JUNIOR HIGH PRACTICAL ARTS PROGRAMS

1. Home Economics

Home economics focuses on the challenges that individuals and families experience in daily living. The program consists of 27 modules organized into three specialty areas: Family Studies, Food Studies, and Clothing and Textile Studies. Each area has three different levels of study containing three modules. One compulsory module from each of the specialty areas plus two complementary modules from any of the areas constitutes a home economics course. Home economics actively involves students in a management process which provides them with the opportunity to learn to use information in directing their daily lives. Implemented September 1988.

2. Agriculture: Land and Life

Agriculture: land and life is designed to provide students with a broad awareness of the economic, social, and scientific realities of the agricultural enterprise. The themes of Production, Processing and Marketing; Technology and Research; and Resource Management are developed in increasing depth over a three year sequence. A survey unit called "What is Agriculture?" is offered during the first year of the program, and optional units reflecting student needs and interests or expanding on local agricultural practices are pursued throughout all three years of the program. Learning is introduced in meaningful contexts, through hands-on activity, experimentation, and examination of current agricultural practice. To be implemented September 1989.

3. Industrial Education

Industrial education provides the opportunity for students to explore, reason, experiment, and discover the reality of the technological society in which they live. The program is divided into four main fields of study--Power Technology, Materials Technology, Graphic Communications Technology, and Synthesizing--which are in turn divided into fifteen modules. Students study a minimum of three different modules each year. Learning tasks are for the most part accomplished through "hands on" activity, lecture, demonstration, research, or audiovisual technique. Current program implemented 1973; revised curriculum to be implemented September 1991.

4. Computer Studies

Computer studies will promote the integration of computers into student learning and problem solving. The three-year program is divided into five themes--Applications, Keyboarding, Productivity, Programming, and Society--each of which contains five modules. Six of the 25 modules are mandatory and represent the minimum requirements for the first year of the program; it is expected that students will take a minimum of five modules per year thereafter. The program encourages integration of computers into other subject areas, but as schools move toward increased integration and the competence of the students develops, emphasis will shift to learning about computers. New curriculum to be implemented September 1990.

5. Business Studies

Business studies, planned for development, is a grade nine course designed to provide students with the opportunity to learn about basic economic and business concepts and principles. The program would consist of eight modules divided into two parts. Part I contains three mandatory modules: The Business World, the Economics World, and Making it Your World. Part II contains five optional modules, of which at least two must be taken. These include Entrepreneurship in Action I and II, and one each on Planning, Financing, and Managing the Business. The course would encourage the application of business principles to local, provincial, national, and international scenes, and presents opportunities to involve local business personnel in the classroom. No date is available for implementation this time.

6. Typewriting

Typewriting develops the students' capability to use a typewriter correctly, to use the correct techniques of touch typing, and to produce acceptable typescript. The course may also include instruction in production typing, proofreading, and editing manuscripts. Typewriting can be taught in grades seven, eight, or nine. Current curriculum implemented in 1973; may be phased out with the implementation of computer studies in September 1990 or 1991.

7. Environmental and Outdoor Education

Environmental and outdoor education will give students the opportunity to learn about basic ecological processes and principles as well as procedures for safe, comfortable outdoor experiences in all seasons. New curriculum to be implemented in September 1991.

# SENIOR HIGH PRACTICAL ARTS PROGRAMS

## BUSINESS EDUCATION

The business education program is composed of 104 one-credit modules, organized into nine strands. Modules are designated as core and elective, some are sequential. Students who obtain over thirty credits in business courses have a good basis for careers in secretarial, accounting, and business management.

### ACCOUNTING 10-20-30

The accounting program provides an opportunity for all students to develop an understanding of basic accounting concepts and procedures. In the introductory level the students will learn the mechanics of the accounting cycle with a personal or small business accounting perspective. Advanced students will enhance the basic skills and provide competencies that prepare the student for employment or further study beyond high school.

### BASIC BUSINESS 20-30

In Basic Business 20-30 students will study the structure and principles that control business, investigate the interrelationship of business systems within the local, national, and international scene. They will examine management techniques and develop an understanding of the fundamental principles and factors related to success in establishing and managing a small business.

### COMPUTER PROCESSING 10-20-30

Computer processing provides students with an opportunity to use the computer to solve simple to complex problems. They will develop the skills and knowledge to use productivity software such as word processing, data base, and spreadsheets, and learn programming using structured languages.

### LAW 20-30

Law 20-30 is designed to promote a student's appreciation and understanding of the legal systems and the laws which regulate rights and responsibilities, personal interactions, and business-related activities. Through analysis of actual cases, the student will develop analytical reasoning skills and an awareness of the legal issues and legal procedures with which citizens, employees, and businesses must deal. The student will study legal and court procedures, and could study criminal law, civil law, tort law, labor law, contract law, consumer law, and family law.

### MARKETING 20-30

Marketing 20-30 provides an opportunity for students to develop knowledge and skills relating to the people, products, and procedures which make up the world of marketing. Students will study distribution of goods and services, inventory procedures, the role of profit, pricing policies, marketing research, advertising, and display.

OFFICE PROCEDURES 20-30

Office Procedures 20-30 provides students with the opportunity to study organizational structures, procedures, and technology common to modern Canadian offices. The course involves decision making within a realistic environment and encourages the development of vocational-level competencies suitable for students interested in clerical or secretarial occupations.

SHORTHAND 20-30

Shorthand 20-30 provides students with an opportunity to become adept in an efficient note taking system that is suitable for personal or career use. Students will learn to produce mailable transcripts from shorthand notes. The study of shorthand can improve basic English skills, expand vocabulary, and enhance employment possibilities

TYPEWRITING 10-20-30

Typewriting 10-20-30 offers an opportunity for the student to develop the keyboarding and word processing skills that are valuable for personal use or vocational preparation. The introductory modules are structured to facilitate development of correct touch keyboarding techniques. The advanced modules build skills in production of mailable letters, reports, tables and other business documents in mailable form. Students expand their production skills by becoming efficient in the use of the equipment and build skill in editing and composition.

COMPUTER LITERACY 10

The Computer Literacy 10 develops student understanding of basic computer operations and terminology, and an appreciation of the technological development of computer systems. The program builds skills, attitudes and interests which facilitate the use of computer systems and promotes a greater understanding and increases utilization of computer technology in other subject areas.

## HOME ECONOMICS

The home economics program is composed of 64 one-credit modules, organized into two subject strands. Modules are designated as core and elective, some are sequential.

CLOTHING AND TEXTILES 10-20-30

In Clothing and Textiles 10-20-30, the opportunity to construct items for home and personal use is used as a vehicle for teaching about clothing and textiles in addition to providing a medium for artistic expression and experience. Students will also discuss cultural and historical interrelationships, consumer responsibility, conservation of energy, design principles, and job opportunities.

FOOD STUDIES 10-20-30

Food studies at the high school level comprises an in-depth study of all aspects of food, and the relationship of food to health, values and lifestyles. Foods are investigated in terms of physiological, sociological and psychological satisfactions in daily living. Practical experiences encourage the development of consumer management, and decision-making skills.

PERSONAL LIVING SKILLS 10-20-30

Personal living skills helps students develop knowledge and skills needed to improve the quality of family life, home environments, and consumer abilities. They will develop an understanding of personal, family, cultural, environmental and economic factors related to life-style choices; and develop skills in management of human and non-human resources.

## INDUSTRIAL EDUCATION- GENERAL

The industrial education - general program consists of the Industrial Education 10, 20, 30 series of courses and is designed for career orientation. These courses were developed primarily for students in laboratories that utilize the multiple activity approach as found in most smaller schools, but they can be taught in unit shops as well.

Students may progress from the 10, 20, 30 series to the Industrial Education 22 level courses upon meeting specified prerequisites or upon recommendation of their principal.

The modules of curriculum are organized within the following career fields; Electricity-Electronics, Materials, Power Technology and Visual Communication.

ELECTRICITY - ELECTRONICS

Basic electricity and electronics I, basic electronics II, equipment servicing, logic circuits, computing systems, introduction to computers, computer programming - introductory, computer programming - industrial applications, communications - introductory, communications - systems, electronic design, and electronic construction.

MATERIALS

General woods, building construction (frame), building construction (sub-trades), cabinet construction (basic), cabinet construction (advanced), general metals, sheet metal, machine metal, arc welding, oxy-acetylene welding, foundry, earths, plastics, textiles, and foods.

POWER TECHNOLOGY

Conventional heat engines, small engine repair, small engine tune-up and troubleshooting, mechanical systems, non-conventional power sources, electrical and electronic systems, electro mechanical and electronic control, appliance repair and troubleshooting, automobile maintenance, fluid power, automobile tune-up, automobile repair, and automobile ownership.

VISUAL COMMUNICATION

Introduction to offset lithography, process photography - line, process photography - halftone, layout and design, topographical and architectural drafting, relief printing, screen process printing, black and white photography - basic, black and white photography - advanced, colour photography, mechanical drafting, customer drafting, and offset printing production.

There are three modules which can be used by a student or a group only once while in the program. These are: research module, development module, and production science module.

## INDUSTRIAL EDUCATION - CAREERS

The Industrial Education 12, 22, 32 program is organized into six career fields. Within each career field students build skills and knowledge related to specific technical occupations. The "12" level courses introduce basic skills, processes and knowledge. At the "22" and "32" levels, skills and knowledge specific to an occupation are developed. Successful completion of seven, 5-credit courses may qualify for recognition by the Alberta Career Development and Employment, Apprenticeship and Trade Certification Branch for credits toward a journeyman's certificate.

### CAREER FIELD: GRAPHIC COMMUNICATIONS

DRAFTING 12-22-32

12 Introduction to Drafting:

Drafting equipment, geometric construction, drawing reproduction, shape description, size description, auxiliary views, sectioning.

22A Engineering Basics:

Shape and size description, mechanical and non-mechanical fasteners, forming processes, elementary piping, detail and assembly drawings, computer graphics (CAD)

22B Architectural Drafting:

Architectural drafting, drafting practices, planning, structural systems, working-drawings, perspective drawings, computer assisted drafting.

22C Topographical Drafting:

Topographical drafting, surveying, drawing equipment, interpretation of field notes, photography, geographical data, map projection, modelling.

32A Engineering Graphics:

Engineering graphics, auxiliary views, revolutions, intersections and surface development, resolution of forces, piping drawings.

32B Advanced Architectural Drafting:

Advanced architectural drafting, planning and design, structural systems, working-drawings.

32C Open Module:

This module is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to provide:

a. in-depth study of previous module
b. on the job drafting
c. instruction in a related field

VISUAL COMMUNICATIONS 12, 22, 32

12 Introduction to Visual Communication:

Visual communication, occupational information and career choices, physiological and psychological implications of visual communication, safety, introduction to image creation, communication design, composition and design, photographic arts, conversion processes, line photography, serigraph, basic offset operation, enlarging, and finishing procedures.

22A Introduction to Photographic arts:

Application of shape, movement and mood, storyboarding, slide development, slide mounting, sequencing procedures, audio presentation procedures, process and application of design principles, basic advertising design, typesetting, photo mechanical transfer, screen photography, mechanical art work, masking and platemaking, reproduction processes, animation processes, pixilation, serigraph, 3-D design, 2-D design, perspective, visual merchandising, promotional display.

22B Photo Illustration:

Slide - tape presentations, prints from slides, special techniques, the process camera, screen photography, advanced slide - tape format, creative photo portfolios, advertising photo portfolio, application to mass production, image conversion, line photography, screen photography, plate making, planography, photo screen preparation, reproduction processes.

22C Introduction to Image Creation:

Review of interrelationships of areas, occupational and educational opportunities, current practices in relation to traditions, tools and materials, techniques, resource information file, two dimensional design (shapes, forms, images), colour theory, the psychological characteristics of colour, the twelve colour wheel, colour schemes, image creation applications, history, illustration, emphasis of visual reality, illustration of object from life, variety of forms of representation, underlying shapes and forms of objects, commercial potential of artwork, reproduction processes (relief, gravure, offset, serigraph, photography).

32A Specialized Photo - Animation:

Cell animation, scenery for animation, image conversion, advanced pixilation, editing and splicing, audio, presentation procedures, photo-serigraphy, photo mechanical transfer, planography, finishing (binding, paddings, collating, cutting, folding, scoring, perforating), portraiture, fashion photography, colour theory, films, exposure, chemical processes, processing techniques (black and white, colour negative film, colour slide film).

32B Visual Media:

The Journalism Process: career information newspaper, and news magazines, future trends, lithography; newspaper style, writing skills, gathering the news, writing the story. Cartooning, advertising graphics layout and composition. Image creation: Photography I, photo illustration. Image conversion, Graphics II, line photography, screen photography, Photography II, prints colour separation. The planographic process, the finishing procedures.

32C Open Module:

This module is open to students who have completed 30 credits, or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth to a module taken previously. Individual students, groups of students or whole classes may elect to study an area in more detail.
b. Allow students to engage in actual work in the visual communications career field supervised by the visual communications teacher and by a craftsman on the job.

GRAPHIC ARTS 12, 22, 32

12 Introduction to Graphic Arts:

Relationship of commercial art and graphic arts, historical development and tradition, relationship with industry occupation information, safety.

Image Creation: Basic drawing, composition and design, symbols, layout, typographic composition.

Image Conversion: Elements and principles of composition, photographic materials, camera types, function and techniques, developing and printing, silkscreen printing, process camera, platemaking.

Finishing Processes: Bindery operations.

22A Introduction and Composition:

History and evolution of printing, safe use of tools and equipment, career information.

Image Creation: Layout and design - newspaper, magazine, art services.

Image Assembly: Pasteup, keyboard composition, ruling/scribing

Typesetting: Mechanical, photo -keyboard typography, imposition basic typing.

22B Basic and Advanced Offset Press Operation:

Printing Presses: History, safety, wash up, cleaning dampeners, deglazing rollers and blanket, replacing dampeners, setting dampeners and ink rollers.

Preparation for Operation: Feed system, impression segment, delivery system moisture system and inking system changing blanket.

Press Operation: Various masters, stock and sizes, black, no registration, single colour registration, single colour registration on different stocks, mutilator registration.

Inks and Their Properties: Quick settings, stay open, process colour, mixing colours, additives and dryers, career orientation and opportunities.

22C Photography (Black and White):

Elements of photographic composition, types of photography, camera types and features, shutters, aperture, exposure, lenses, film structure and types, chemicals, times, processing, contact and projection printing, finishing.

Photography (Black and White: advanced):

Photo-story, lighting, camera handling and operation, lenses and their use, shutters and aperture, electronic flash, filters and filtration, light sensitivity of films, colour sensitivity of films, exposure meters, and exposure readings, processing, print permanency, enhancement, mounting, special effects.

Colour Photography:

Exposure of colour slides and colour negative film, colour temperature, colour range, flash exposure, portraiture, camera adjustment, lenses, slide copying, slide/tape presentation, colour permanency, print characteristics, finishing.

32A Process Camera, Stripping and Platemaking:

Line copy, screened copy, photo-mechanical technique, duo tones, stripping - masking, platemaking, colour separation.

32B Basic Bindery Operations and Finishing:

Papers: fabrication, kinds, uses, Bindery Operations - cutting, jogging, folding, scoring, and perforating, punching, stitching, collating and interweaving, padding, Packaging; related operations (laminating, dry mounting, embossing and verkotyping, maintenance, careers.

32C Open Module:

This module is open to students who have completed 30 credits, or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth to a module taken previously. Individual students, groups of students or whole classes may elect to study an area in more detail.
b. Allow students to engage in actual work in the Visual Communications career field supervised by the Visual Communications teacher and by a craftsman on the job.

**CAREER FIELD: MECHANICS**

AUTOMOTIVES 12, 22, 32

Mechanics

12 Introduction to Automotives:

Career field study, safety, shop practices, automobile care and ownership, power sources, engine support systems, transmission of power.

Automotives

22A Suspension, Steering, and Brakes:

Suspension: stability and control, wheel and tire assembly, steering gear, steering geometry: alignment, problem diagnosis. Brakes: types, power assist brakes, brake principle, maintenance and repair.

22B Power Train Components and Service:

Clutch, transmissions, drive lines and universal joints, rear axle assemble, principles of differential gear adjustments, disassembly, inspection and assembly of differential, trans axles, axles, independent rear suspension.

22C Electricity and Magnetism:

Control of electrical power. Sources of electrical energy; battery - cell composition, electrochemical energy, testing, servicing. Sources of electrical energy; generator/alternator; component identification, "troubleshooting", testing application of electricity to the automobile: starting system, ignition system, lights, junction blocks, electronic ignition, compression ignition, electrical accessories, colour coding of electrical circuitry. Oxyacetylene heating and cutting; equipment, safety code and practice, equipment operation.

32A Fuel System:

Types of fuels, fuel system components. Tune-up Test equipment, operational sequence, checking other systems of the automobile that relate to tune-up. Exhaust and emissions control systems.

32B The Internal Combustion Engine: Construction and Operation

The maintenance and repair of the internal combustion engine: disassembly procedure, engine assembly, tune-up, sequence of operations. Engine support systems: cooling, lubrication.

32C Open Module:

This module is open to students who have completed 30 credits, or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth to a module taken previously. Individual students, groups of students or whole classes may elect to study an area in more detail.
b. Engage in actual garage work through a program coordinated by the automotives teacher and under a journeyman mechanic on the job.

RELATED MECHANICS 12, 22, 32

12 Career Field Study:
occupation, employment opportunities, trade certification. Safety - unsafe acts and conditions, operations of tools and equipment, accident reporting, compensation, first aid.

Shop Practices:
hand tools, measuring instruments, fasteners, specialized equipment, repair manuals and specifications.

Automobile Care and Ownership:
body maintenance, chassis inspection and maintenance, inspection and maintenance, insurance (optional), vehicle purchasing (optional).

Power Sources:
types of engines, methods of piston engine classification, piston engine terms, engine construction and operation.

RELATED MECHANICS 22A - Power Systems:

Internal combustion Engine - construction and operation.
The maintenance and repair of the internal combustion engine disassembly procedure, engine assembly, tune-up, sequence of operations. Engine support systems - cooling, lubrication.

22B Framing - Residential:

Floor Support and Framing Systems:
wood foundations, built-up beams, girders and columns, floor joist systems, bracing, floor sheathing quantity and cost survey.

Wall Framing:
basic framing systems, platform framing, wall sheathing, quantity and cost survey.

Ceiling and Roof Framing:
ceiling framing roof framing, cornice work, roof sheathing, special ceiling and roof framing systems.

22C Residential Wiring:

Career opportunities, safety, wiring installations: planning, installation, re-wiring.
Management Practices: organization, bidding for work, employee concerns.

32A Benchwork and Lathe Operations:

Safety, general machine shop maintenance:
machine lubrication, machine tool maintenance and repair, proper use and care of all tools and equipment.

Blueprint Reading:
object visualization and drawing interpretation. Layout and measurement, benchwork, material removal by machining, metallurgy, metal working occupations.

32B Introductory Welding:

Course overview, career patterns, safety, fusion welding; oxyacetylene equipment, setting up new equipment, gas pressure and flame adjustments, production of gases, filler rods, shop practices, arc-welding, basic process, polarity/circuity, electode, types of welds. Thermal separation; safety, metal oxidation, cutting equipment, straight and bevel cutting, piercing. Measurement, tools and shop equipment: measurement and layout tools, hand tools, power tools and machines, braze welding and soldering, fabrication and repair.

32C Open Module:

This is a developmental module. It may replace any of the following modules: Related Mechanics 22A, 22B, 22C, 32A, or 32B. Advanced study may be continued in any of the topics covered in the courses listed under Related Mechanics or on the job training under the supervision of the Related Mechanics teacher and a journeyman on the job.

22B Autobody Construction:

Body component shaping, assembly. Alignment theory and application. Autobody Welding - joints. Door repair.

22C Management in the Autobody Trade:

Automotive plastics - identification and repair. Bumper repair, skill development for vehicle repair: aligning, welding, finishing, filling, painting.

32A Estimating Autobody Damage:

Painting equipment and the spray booth.

Autobody alignment:
shaping and aligning components - doors, trunk lid, decks, glass.

Metal finishing:
picking and filing, filling - (metal and plastic), abrasives. Live repairs.

32B Autobody Electrical:

Circuits, headlight aiming, painting. Frames and alignment: frame straighteners, wheel alignment. Welding: braze welding, M.I.G. welding, Interior repair: glass installation, care and cleaning.

32C Open Module:

This module is open to students who have completed 30 credits in the subject. The 125 or 250 hours of available time may be used to:

a. provide more time to practice skills in content take previously. Individual students, groups of students, or a whole class may elect to study an area in depth.
b. engage in actual work supervised by the Autobody teacher or a work study coordinator and a journeyman on the job.
c. further preparation for students planning to enter apprenticeship.

**CAREER FIELD: CONSTRUCTION**

BUILDING CONSTRUCTION 12-22-32

12 Tool Processes Used in Measuring and Layout:

safety, shaping materials - removal, combining, forming; tool maintenance, applied mathematics and measurement; planning and design; materials - wood, glue, wood finishes; career field study.

22A Introduction to Cabinet and Furniture Making:

design, material, processes, tools; basics of cabinet making - joints, assembly; finishing - reasons for; design - function, appearance.

22B Concrete and Form Building:

principles of laying out building lines - legal description, reference points, soils and excavations, measurement of quantities; form construction; principles and practices of making concrete - definition of concrete, materials used, proportions, testing, estimating.

22C Framing - Residential:

floor support and framing systems - wood foundations, built-up beams, girders and columns, floor joist systems, bracing, floor sheathing, quantity and cost survey. Wall framing - basic framing systems, platform framing wall sheathing, quantity and cost survey. Ceiling and roof framing - crevice work, roof sheathing, special ceiling and roof framing systems.

32A Exterior Finishing:

introduction to Exterior Finishing - design, materials. Blueprint reading, architectural drawing and sketching, working drawings, pictorial drawings, freehand sketching; Safety - scaffolds and ladders; power and hand tools. Roof coverings; cornice and eave projection; exterior doors and windows; exterior wall coverings; exterior trim - materials, preparations, systems, installation, hardware, application.

32B Interior Finishing:

Management and Related Trades;
Insulation, vapor barrier, ventilation - energy efficiency, insulation value, energy conservation.

Interior walls; ceilings; floors; trim; wall finishes; ceiling finishes; floor finishes; interior trim; quantity and cost surveys.

Stair construction - design, cutting, assembly, handrails and balustrades.

Interior doors - types and accessories, fabrication and installation.

Cabinets, vanities and closets - construction, installation, shelving, bars, racks.

Protective and decorative coatings - materials and application.

32C Open Module:

This module is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth to a module previously taken. Individual students, groups of students or the whole class may elect to study an area in depth. This could be cabinet making, framing (commercial or residential), concrete work or any of the modules named in the building construction sequence.

b. Engage in actual construction work supervised by the Building Construction teacher as a work experience coordinator and a journeyman on the job.
c. Further preparation for students planning to enter apprenticeship.

MACHINE SHOP 12-22-32

12 Benchwork and Lathe Operations:

Safety; general machine shop maintenance - proper use and care of tools and equipment, tool maintenance and repair, lubrication.

Blue Print Reading; layout and measurement; benchwork; machine tools; metallurgy; metal working occupations.

22A Basic Machine Shop Theory and Practice:

Safety and Health Hazards; review of maintenance and repair; interpretation of drawings - freehand sketching and layout; hand operations and metals; cutting tools; aluminum and it's alloys.
Lathes - tools, procedures and accessories.
Large Drill Press - holding devices, cutting edges, cutting speeds, drill sizes.
Power Saws - hacksaws, handsaws.
Shapers (optional)
Milling Machines (introductory) - horizontal, vertical.
Career Planning - career field occupations, employment opportunities.

22B Lathe, Milling and Grinding Operations:
Safety and health hazards.
Ongoing machine shop maintenance
Drawing interpretation, sketching, estimating
Metallurgy - cutting tools, copper and it's alloys.
Lathes, milling machines, surface grinding machines, fasteners, broading, mating parts, career planning.

22C Advanced Machining:

Safety and Shop Regulations; general machine shop maintenance; blueprint reading, sketching and design; metallurgy - steel and its alloys; physics of metal cutting - chip formation, cutting tool geometry, tool life and the effect of temperature and friction, cutting fluids; milling machines; grinding machines; career opportunities.

32A Construction and Fabrication:

Safety and Shop Regulations; general machine shop maintenance; blue print reading and sketching, metallurgy - non ferrous metals; materials in different forms; lathes - advanced; advanced milling machine (optional); grinding machines; career opportunities.

32B Advanced Machinery Operations:

Safety and Health Hazards; general machine shop maintenance; blueprint reading, sketching and estimating; heat treating and acetylene welding; jigs and fixtures; bearings; lathe (advanced);milling machine, advanced (optional); grinding machines; special machine processes (optional); patents; career opportunities.

32C Open Module:

This module is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth for a module taken previously. Individual students, groups of students or whole classes may elect to study an area in depth.
b. Engage in actual machining work supervised by the machine shop teacher or a work study coordinator and a journeyman on the job.

WELDING 12-22-32

12 Introductory Welding:

Course overview and career patterns; safety; fusion welding - oxyacetylene equipment, gas pressure and flame adjustments, production of gases, filler rods, shop practices, arc-welding (basic), electrodes, types of welds;
Thermal Separation - theory of metal oxidation, cutting equipment, straight and bevel cutting, piercing; measurement, tools and shop equipment; braze welding and soldering; fabrication and repair.

22A Fundamental Welding:

Safety - apparel; shape description, sketching, dimensions and symbols; electric arc processes - terminology, machine types, types of electrodes, weld position; oxy-fuel process - torch, pipe welding molecular structure, forming metals (optional), heat treating of steel (optional); fabrication and repair.

22B Intermediate Welding:

Safety - use of tools, approval, position welding; shape description, size description, welding symbols; drawing interpretation and fabrication; metal identification; metallic arc welding, oxy-fuel welding; fabrication and repair.

22C Advanced Welding:

Safety - G.M.A.W. and G.T A.W processes, arc-air gouging, fumes; shape description, multiview drawings, drawing type conversion, size description, welding symbols; interpretation of a variety of drawings; electric arc processes - vee butt joint plate welding, vee butt joint pipe welding, testing welds, special electrodes, separation; special oxy-fuel applications - fusion welding non ferrous metals, hardsurfacing; gas metallic arc welding (G.M.A.W.) - Safety, power sources, techniques, gas tungsten arc welding (G.T.A.W.) (optional) - equipment, power sources, terminology, theory of operations, techniques; fabrication and repair.

32A Specialization in Welding:

Safety - review and reinforcement, G.M.A.W. processes; sketching, drafting and blueprint reading - line conventions, projections, symbols.
Gas metal arc welding - theory, techniques; template layout and pattern development.

32B Fabrication and Repair:

Welding shop safety - enforcement, accident reporting and recording; design and fabrication, working from a drawing, following verbal direction, repair using a variety of welding techniques; properties of metals, identification of metals, classification.

32C Open Module:

This is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. provide greater depth to a module previously taken in the welding sequence. Individual students, groups of students or the whole class may elect to study an area in depth.
b. engage in actual welding on the job, supervised by the welding teacher as a work study coordinator and by a journeyman.

PIPING 12-22-32

12 Introductory Piping:

Career fields - occupations, opportunities; trade study - apprenticeship and certification, structure of the piping industry, history and minor organization; safety; measurement - systems, instruments, layout; pipe tools and methods of joining pipe - threading, soldering, cementing, m.j. joints, older types of joints; adapting pipes and fittings; identifying, selecting and ordering materials - fittings, valves, function.

22A Domestic Plumbing:

Rough-in procedures - plan, layout, cutting, assembly and installation; finishing procedures, water closet, varieties, water lines, waterheater, testing.

22B Domestic Heating:

Hot water heating - sizing and erecting a boiler, radiation and convection systems, insulation and preparation for operation, adjusting and setting controls; gas fitting - planning, sizing, layout, installation, testing, sizing and erecting gas appliances, activating, adjusting, setting and servicing gas appliances, venting gas appliances, converting gas appliances for domestic use.

22C Commercial and Industrial Heating:

Low pressure steam heating - sizing, erecting and installation, selecting and installing radiators, convectors, and unit heaters, adjustment and setting of controls; application of steam other than heating - hanging and supporting pipe, expansion and contraction allowances.

32A Drawing and Estimating:

Symbols, scales, specifications, rough-in books, drawing instruments, types of lines and drawings, use of drafting instruments, symbols, scales, lines and rough-in books, blueprint readings; drawing plans and isometric views of piping - planning an elevation sketch, isometric drawing.

32B Commercial and Industrial Plumbing:

Roughing-in and finishing procedures in multiple storied building, or industrial plants - drains in large buildings, sleeves and inserts in large buildings, prefabrication techniques, wall hung fixtures, sizing rain water leaders "seventies" techniques.

32C This module is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. provide greater depth to a module taken previously. Individual students, groups of students, or the whole class may elect to study an area in more detail.
b. engage in actual pipe fitting or plumbing work supervised by the piping teacher as a coordinator and a journeyman on the job.
c. apply some of the time in work study or work experience.
d. study the sprinkler fitter trade.
e. introduce students to solar heating systems.

SHEET METAL 12-22-32

12 Introduction to Sheet Metal:

Career field occupations, related occupations, employment opportunities, trade certification; safety; industrial forces - social structure, collective bargaining , apprenticeship; measurement - systems, instruments, layout; tool processes - mechanical removal, thermal removal, chemical removal, combining, forming; elements of pattern development - simple, parallel line, radial line.

22A Pattern Development:

Principles of sheet metal layout - simple shapes, (rectangular, cylindrical, hexagonal), seams and hems, parallel line development (metered cylinder, round elbow, cylinder - to - cylinder intersections), radial line development (roof jacks, funnels, reducers), triangulation.

22B Joining:

Joining Sheet Metal - Mechanical (bolts, rivets, seams), self-locking seams, adhesion-soldering, cohesion-welding (oxyacetylene, arc-welding, TIG and MIG, carbon arc, resistance).

22C General Sheet Metal Work:

Rectangular objects - layout and related theory, rectangular pans, duct fittings, metal clad doors and frames; cylindrical objects - layout and fabrication of: roof jack, round pipe, chimney hood, round elbow, round offset intersecting cylinders; conical objects - layout and fabrication of: funnel with splash lip, frustum of a cone, truncated cone.

32A Heating and Air Conditioning:

Analysis and explanation of air-conditioning systems - types of fittings, controlled humidity, controls, installations, electronic filters; analysis of gravity and forced air systems; solar system high efficiency furnaces and related units.

32B Sheet Metal Cabinet:

General cabinet work - metal desk, filing cabinet, metal tables, mechanics tool box, barbecue, hospital equipment - sinks, table tops, kickplates, laundry chutes; restaurant equipment - dishtables, sinks, salad tables, coffee urn stands, tray rails canopies, store fronts.

32C This module is open to students who have completed 30 credits or six modules in the major. The 125 hours of instruction time available in this module may be used to:

a. provide greater depth to a module taken previously.
b. engage in actual sheet metal work, supervised by the sheet metal teacher as a coordinator of the student, and a journeyman on the job.

ELECTRICITY 12-22-32

12 Introductory Common Module:

Career fields - occupational information; safety; first aid; use of hand and power tools; definition, sources; conductors and insulators; magnetism and electromagnetism; units, measurement, circuits, diagrams and laws; circuits, systems study and project work.

22A Alternating Voltage and Current:

A-C power generation, audio and radio signals; inductance; capacitance; capacitive reactance; capacitive circuits; a-c circuits; semiconductor and vacuum tube diode; power supplies.

22B Residential Wiring:

Career opportunities; safety; wiring installations; re-wiring; management practices - organization, bidding, employee concerns.

22C Electrical Servicing:

Occupational information; service equipment; service information; troubleshooting; appliance cleaning, inservice factors.

32A Commercial Wiring

Technical drawing - view, dimensioning and symbols; wiring methods - raceways and conductors. tools and equipment, fittings and boxes; installation of services and feeders - service entrance, protective equipment, metering equipment; control equipment; lighting equipment - installation; heating controls.

32B Electro - Mechanical

D-C generators - construction, commutation, fields, inter-poles, characteristics; D-C motors; torque; shunt fields; series fields; compound motors; armature reaction; starters; speed control. A-C Generators - two pole, rotating field, voltage regulation, three phase generator, parallel operation; A-C motors - 3-phase induction, 3-phase wound rotor motors, capacitor - start - split phase, synchronous, self synchronous, shaded pole, series or "universal", manual and magnetic starters, relays, interlocks, timers and transducers. Transformers - ampere turns, voltage and current ratios, paralleling transformers and transducers, special purpose transformers.

32C Industrial Electricity:

Oscilloscope - parts, operation, terminology, controls, uses; semiconductors - structure and behavior, power supply - diode, rectifiers, single-phase half-wave, single-phase center-tap, single-phase, bridge, three-phase half-wave three-phase full-wave; filters; zener regulator, transistor - theory and operation and uses; silicon controlled rectifier; triac.

ELECTRICITY AND ELECTRONICS 12-22-32

12 Introductory Common Module:
(see Electricity 12 for content description)

22A Basic Principles of Active and Reactive Circuits Alternating voltage and current - source, values, angular measure, resistive a-c circuits, sine wave frequencies and classes, a-c power generation, bridges - resistance, inductive capacitive, component connection, testing; inductance - self-inductance, inductance of a coil, mutual inductance, transformer action, total inductance, inductive reactance, L.R. circuits, time constants, testing. Capacitance - definition, classification; capacitive circuits; a-c current circuits; resonance, electrical filters, cathrode ray tube, power supply, complex numbers (optional)

22B Solid State Electronics:

Solid state fundamentals; junctions; transistors; other solid state devices - silicon controlled rectifier, thermister, injunction transistor, field effect transistor; integrated circuits - classification, advantages and disadvantages, symbols, operating mode, basic linear amplifier circuits, voltage and current circuits, non-linear signal processing circuits, generators, active filters.

22C Digital Logic Field of Electronics:

Numbering systems; fundamental digital concepts and basic electronic building blocks - AND'S, OR'S and NOT'S, basic logic gates, logic conventions, power requirements of TTL and CMOS IC's, logic families, radiant emission from semi - conductor P.M. junctions; Boolean algebra; codes; electronic realization of logic circuits; application of logic circuits in integrated circuits.

32A Radio Communication:

Principles of radio transmission/reception; power supply circuits; audio amplifier fundamentals; principles of radio receivers; oscillator principles; F.M. radio receivers; antennas and transmission lines; communication receiver and transmitter.

32B Advanced Circuitry - TV Receivers and Servicing:

Introduction to production of television pictures; TV picture tube accessories; TV power supply; deflection oscillators; synchronization circuits and automatic frequency control; vertical sweep section; horizontal sweep section; video detector and amplifier; picture IF system; the R.F. tuner; TV sound system; colour television; antenna and transmission lines.

32C Computers:

Basic microcomputer terminology - digital and analog computers, microprocessor and microcomputer, microprocessor architecture - unique features; microcomputer instruction codes; machine language programming; advanced programming and interfacing (optional).

**CAREER FIELD: PERSONAL SERVICES**

BEAUTY CULTURE 12-22-32

12 Introductory Module:

Career field study - occupations, trade certification, employment opportunities; ethics - behavior, character development; equipment and implementation - identification, safety; hair styling - setting, comb-out; physiology, trichology, analysis; hygiene and sanitation - Bacteriology, hygiene, sterilization and sanitation; cosmetic chemistry - PH; skin care and make-up; manicure (optional).

22A Hairstyling, coloring, treatment; facials, histology of skin. Hairstyling; hygiene and sanitation (advanced); hair and scalp treatment; hair coloring - rinses; the skin - anatomy, physiology, histology; facials; cosmetic chemistry (advanced) - cosmetic vs drugs.

22B Disease and disorders of hair; permanent waving; basic hair cutting.
hair cutting - elevation; permanent waving - cold wave, heat wave, chemical disposal; anatomy - physiology - histology - metabolism, the skin and is appendages; disorders and diseases of the skin and it's appendages.

22C Practical skill development for customer service. Receptionist training; customer service - public relations; hairstyling; hair coloring - semi permanent and permanent: color theory, predisposition, mixing and application.

32A Fashion trend hairstyling, color removal, product knowledge and content, customer service operations. Hairstyling - fashion trends: trend variations, implementations, day, cocktail, evening conversions; color removal, bleaching - stripping: bleaches, strippers, the "double process", accelerators; chemistry of cosmetology (3): cosmetic chemistry, product identification, mixing chemicals, customer service: competency, speed.

32B Individualized hair fashions, coloring techniques, hair straightening, advanced customer service operations.

Hairstyling - individualized trend - facial analysis and other characteristics, hair coloring - high fashion techniques; hair straightening - chemical, physical; customer service - competency, speed, salesmanship.

32C Esthetology Services:

Esthetics, equipment, tools and practice. Facial and skin care advanced; wigs and hairpieces - types of hair and fibres, types of hair goods, servicing wigs and hairpieces; competition hair dressing; advanced hair coloring; customer service/work study.

32D Advanced Customer Service:

Competency/speed; salesmanship - theory practice, implementation; merchandising, product knowledge promotional activities; advanced permanent waving; professional ethics; shop management - overhead, personnel, bookkeeping, labour relations; review of curriculum - reinforcement, work experience.

FOOD PREPARATION 12-22-32

12 Introduction To Commercial Food Preparation Opportunities in the food service industry; utensils and cooking equipment; tools and processes used to serve and portion foods; tool processes used to cut, form and mix foods for cooking; safety in the kitchen; storage of foods; cleaning and sanitation; measuring and planning; basic nutrition and menu planning; practical cooking.

22A Kitchen Production:

Vegetable cookery - classification, standards, cooking techniques; stocks, soups - standards, classification garnishes; sauces; gravies; meats.

22B Cold Kitchen Production:

Sandwiches, pantry; salads; appetizers; desserts and short pastry products.

22C Short Order:

Short order cooking; dairy products; fats and oils, cereals and breakfast foods; serving food.

32A Kitchen Production - Meat:

Meat - proper cooking, it's fibre structure, it's fat and moisture content, connective tissue, consumption; fish - high food value, versatility; poultry - methods of cooking, kinds of meat, dressing; sauces, soups, salads, and vegetable dishes; service to the public.

32B Baking and Decoration:

Baking ingredients - the properties that they exhibit under various conditions; cakes, pastries and yeast doughs - variation of ingredients and method, mixing; decorating and filling cakes, yeast goods and pastries; desserts - selection, suitability, preparation.

32C Kitchen Management:

Managing the kitchen; nutrition; purchase, storage and control of kitchen supplies: planning work activity; cost control and menu pricing; serving of food; preparation for employment.

32D This module is open to students who have completed all of the preceding modules. The 125 hours of instruction time available in this module may be used to:

a. provide greater depth to a module taken previously in the sequence.
b. engage in actual food service work on the job supervised by the Food Preparation teacher and a chef on the job.

HEALTH SERVICES 12-22-32

12 Basic anatomy, physiology and pathology skeletal system - anatomy and physiology, diseases and injuries, treatment of diseases, treatment of injuries, home nursing care; circulatory system - anatomy and physiology, common injuries, diseases; respiratory system - anatomy and physiology - injuries, diseases; miscellaneous injuries and diseases - emergency treatment; careers - occupations.

22 Anatomy, physiology and pathology with regard to six body systems:

Integumentary system - anatomy and physiology, common diseases; endocrine system - anatomy and physiology, common diseases, hospitalization; nervous system - anatomy and physiology, diseases, injuries, treatments and nursing care; digestive system - anatomy and physiology, disease, and disorders, nutrition, surgical care, urinary system - anatomy and physiology, diseases, urine; reproduction system - anatomy and physiology, diseases and disorders, pap smear, gown glove and isolation technique.

32A Pregnancy, postnatal and child care; obstetrics - reproductive system, pregnancy, complications of pregnancy, labour and delivery, post partum care; pediatrics - physical and emotional care of children, normal growth and development, newborn, infancy, toddlers and pre-schoolers, school age, adolescence; child-care - parenting skills, basic child care.

32B Medical nursing, surgical nursing, gerontology, career exploration.
Medical nursing - alcohol the social drug, drug use and abuse, cancer, psychiatric; Surgical nursing - pre-op care, post-op care, home care; gerontology - aging process, senior citizens lifestyles, death and dying; career exploration - health care field, field experience

## CAREER FIELD: HORTICULTURE

HORTICULTURE 12-22-32

12 Introductory Module:

Landscaping - lawns, herbaceous material, woody ornamentals; indoor plants - cultural requirements, propagation, sexual, asexual, bedding plants; soils and fertilizers - analysis and application; food production - vegetables, planning a garden; botany and biology, functions, structures, insects; greenhouses - structures, maintenance, equipment; pruning - techniques, application; floral design - use of materials, construction of articles.

22A Greenhouse Production:

Food and Ornamental plants - identification, propagation, maintenance, planting, cultural requirements; greenhouse - structures, maintenance, pest control; greenhouse systems - venting, fertilizing, cooling, heating, selection of system; safety - recognition, application; soils in greenhouse - analysis, PH structure, diagnosis, remedy application; practical project - research, completion.

22B Constructing and maintaining landscapes:

Introduction to ground maintenance - identification of: groups of plants and trees, environmental needs of landscape plants, tools and equipment, commercial ground maintenance operations; scheduling and planning ground care activities - spring, summer, winter, fall; site preparation - grading, soil improvement, soil fertility, soil structure, choosing suitable plant material; planting trees, shrubs, lawns, annuals and perennials; general maintenance of landscaped areas; operation of equipment and use of tools; landscape construction and maintenance specifications.

22C Landscape plans, floral designs:

History of park and garden development, objectives and reasons for landscaping; design factors for commercial and residential design; drawing preparation for landscape plan; cost estimating; using annual and perennial flowers in a landscape; design and use of indoor plants; design work using flowers and plants.

32A Commercial crop and Nursery Production:

Nursery site selection; identification of woody ornamentals; propagation and maintenance of woody ornamentals and commercial greenhouse crops; nursery development; marketing procedures; scheduling of crops; greenhouse cost accounting; practical project.

32B Theoretical aspects of production in relation to biology, organic gardening, food crop production, and ecology.

Biological aspects of horticulture; horticultural crops; organic gardening, ecological aspects; ecological aspects of parks and other landscapes.

32C This module is an intensive overview and expansion of the previous modules in horticulture with particular emphasis on landscape construction pesticide application equipment operation and business management. Work study in the major component consisting of 125 hours of practical experience in a horticultural industry.

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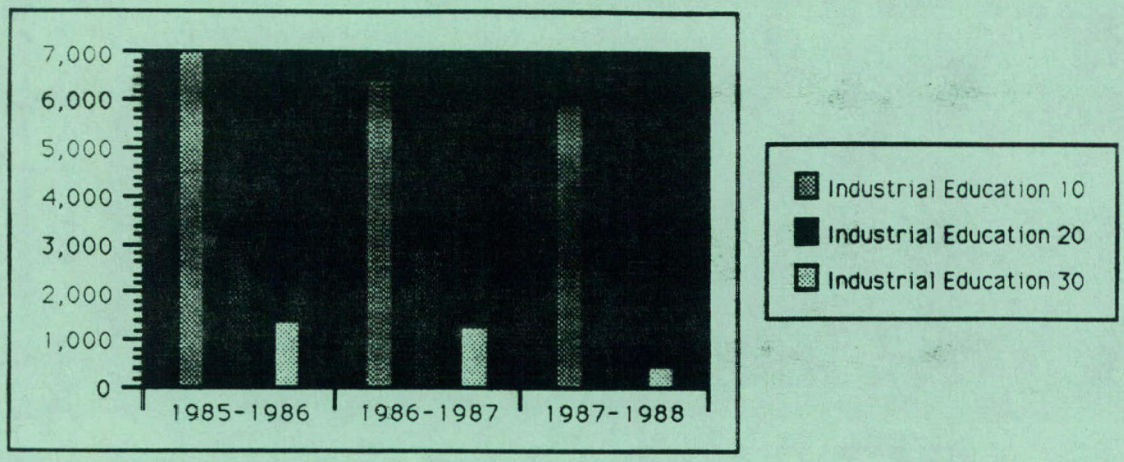
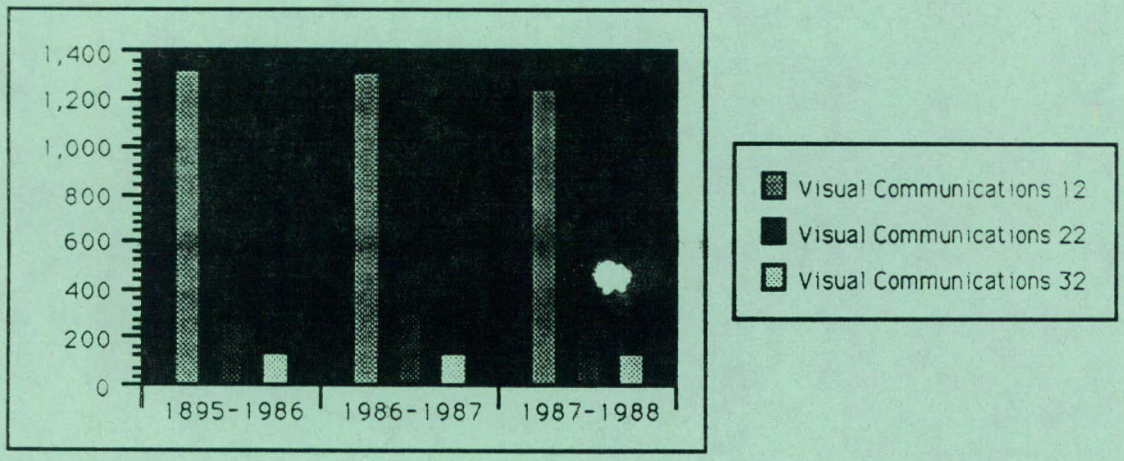
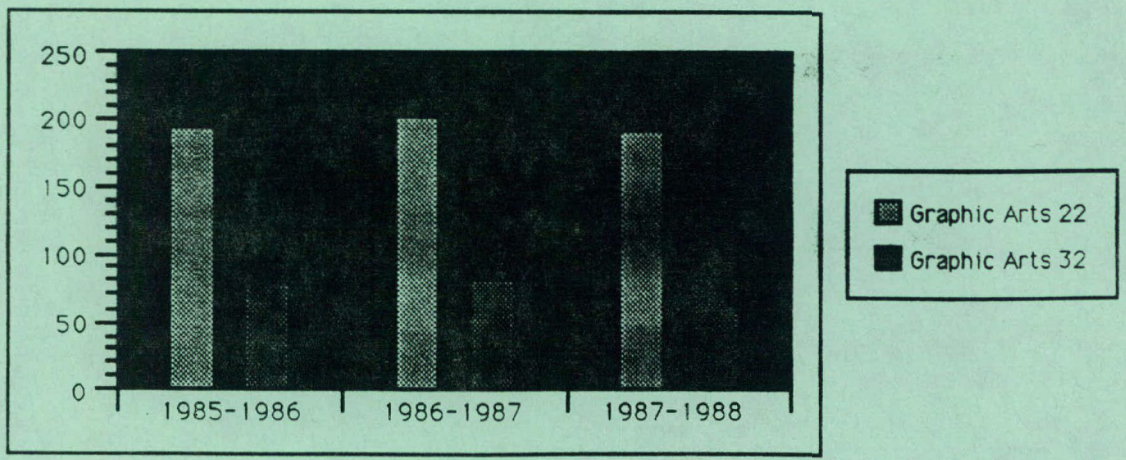
Industrial Education General-Enrollments

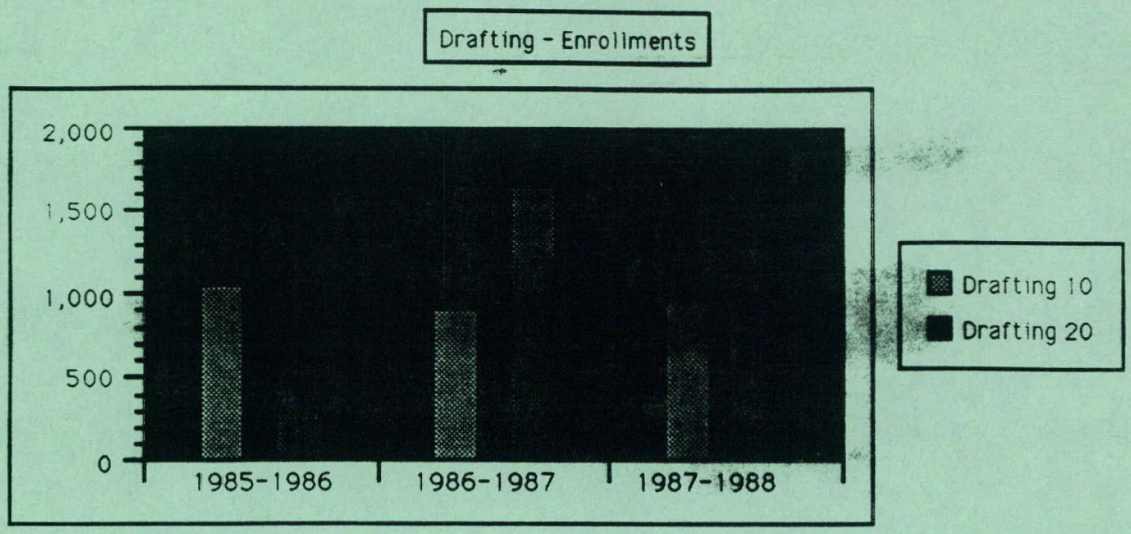


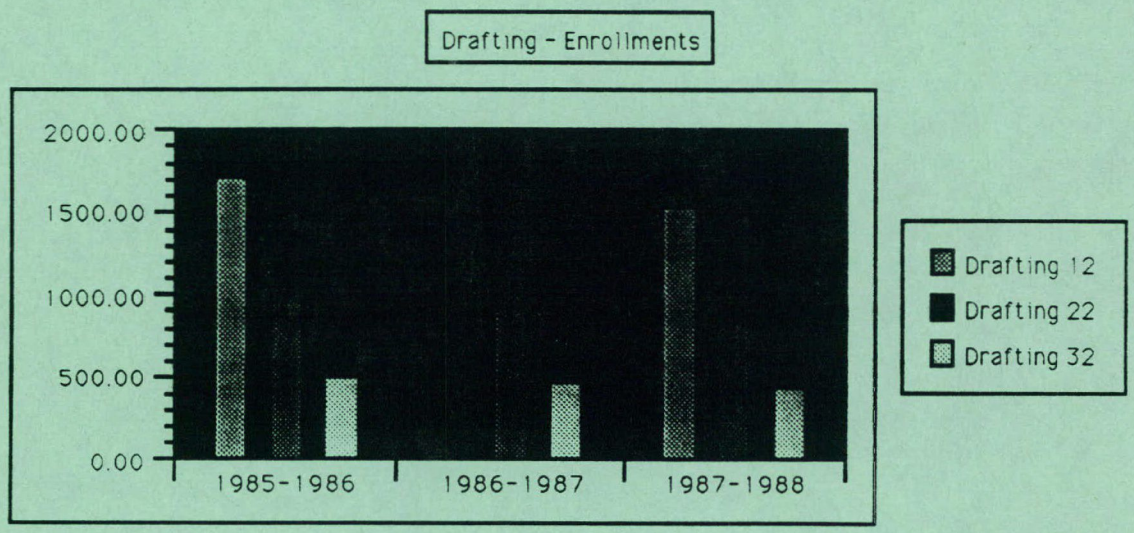

Visual Communications- Enrollments




Graphic Arts - Enrollments




Drafting - Enrollments
2,000
1,500
1,000
500
0
1985-1986
1986-1987
1987-1988
Drafting 10
Drafting 20


Drafting - Enrollments
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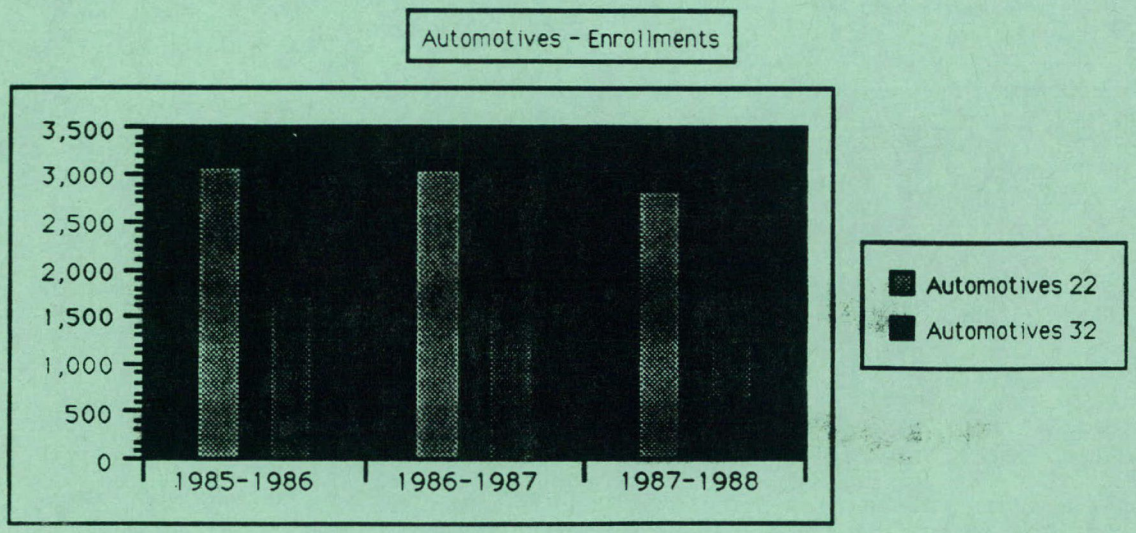
1987-1988
Drafting 12
Drafting 22
Drafting 32


Automotives - Enrollments
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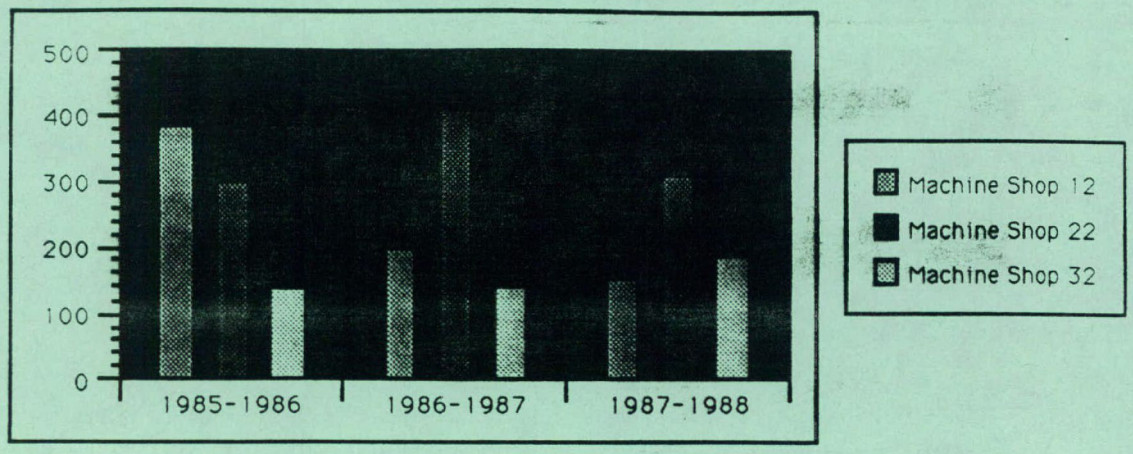
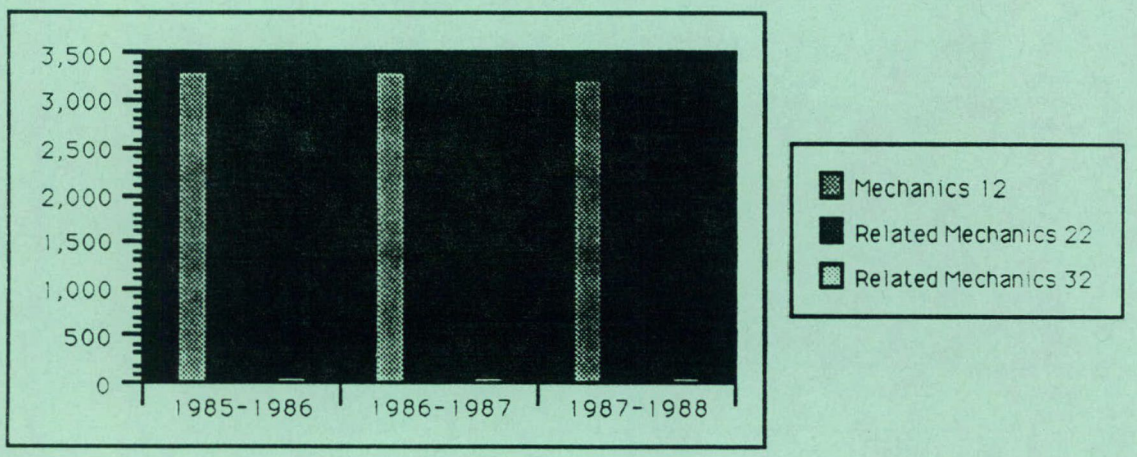
1985-1986
1986-1987
1987-1988
Automotives 22
Automotives 32

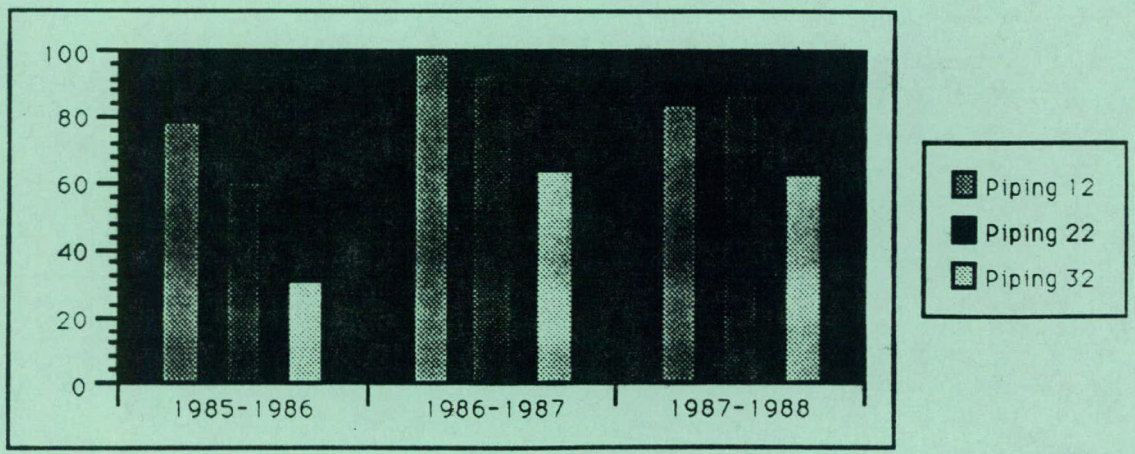
Machine Shop - Enrollments



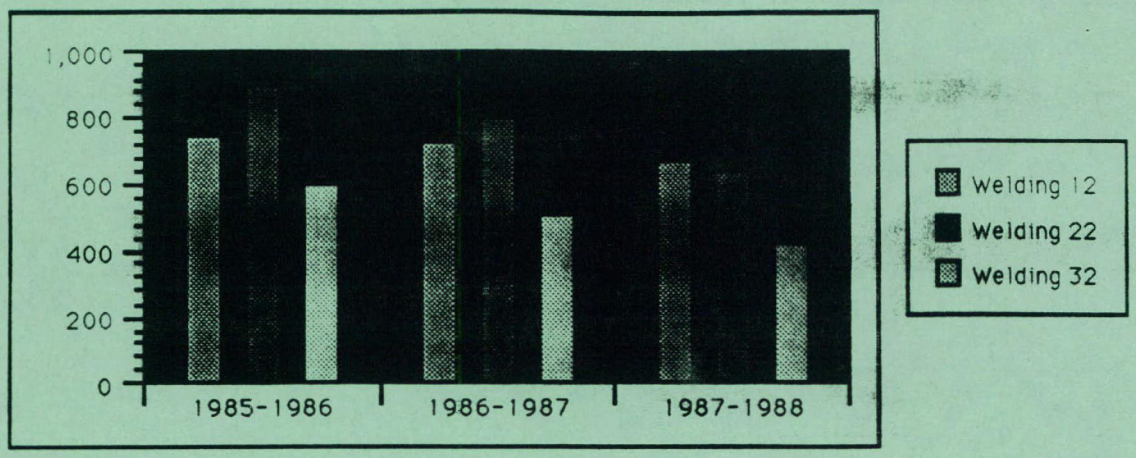

Mechanics - Enrollments



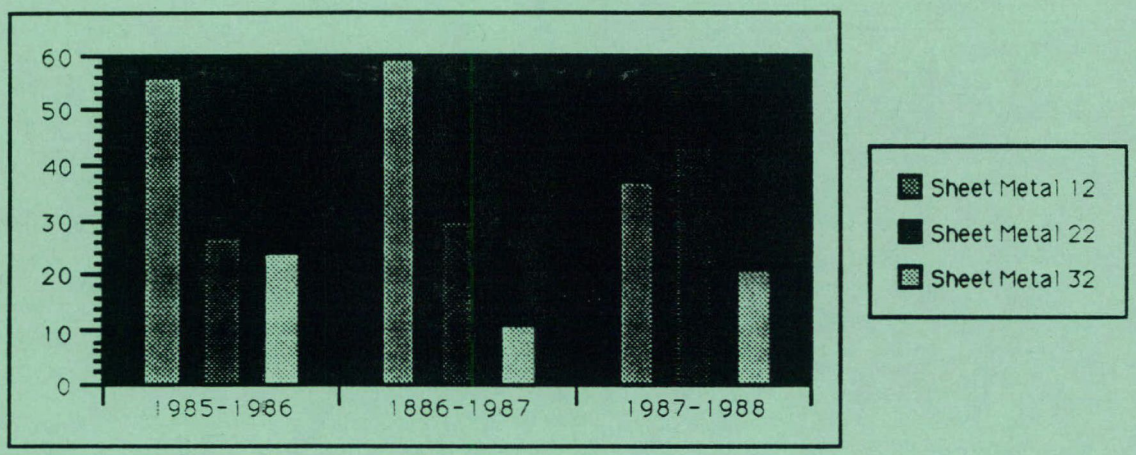

Piping - Enrollments



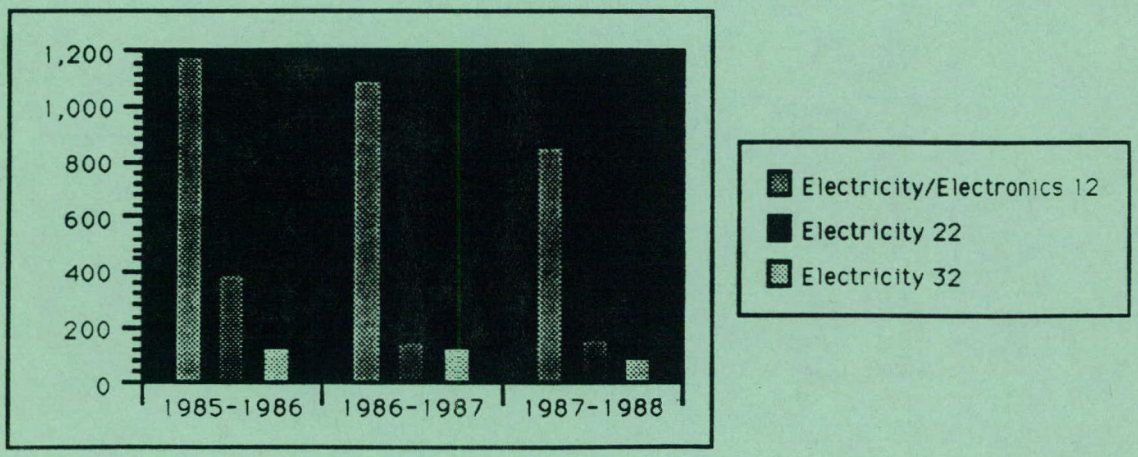
Welding - Enrollments



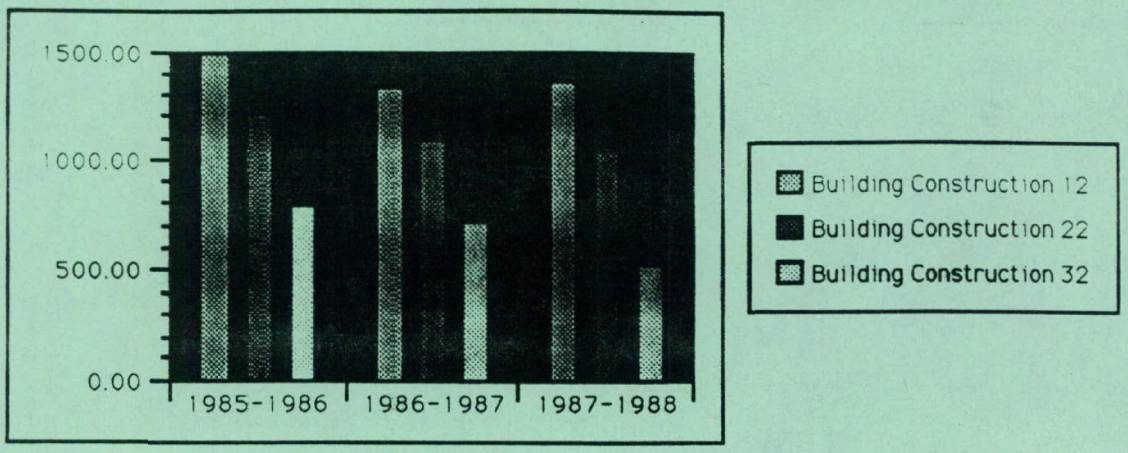

Sheet Metal - Enrollments



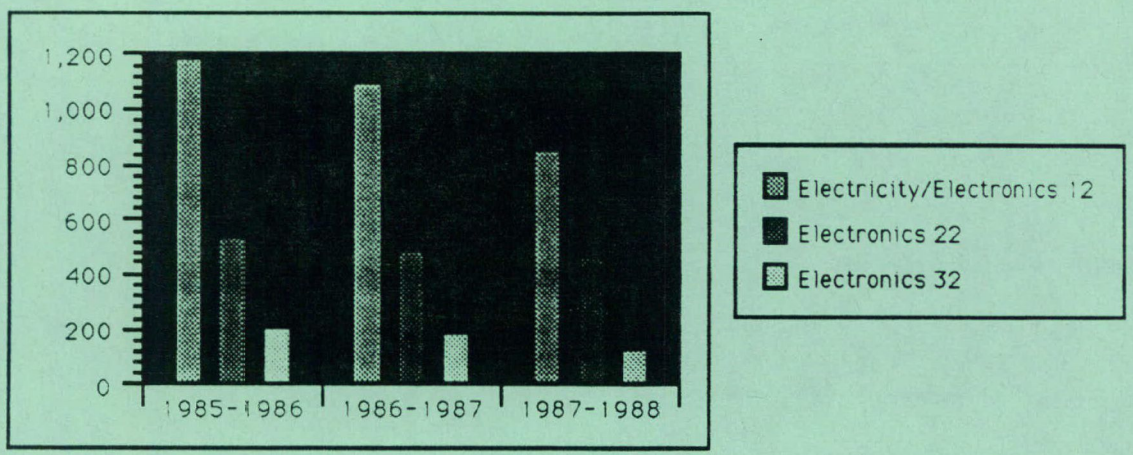

Electricity - Enrollments



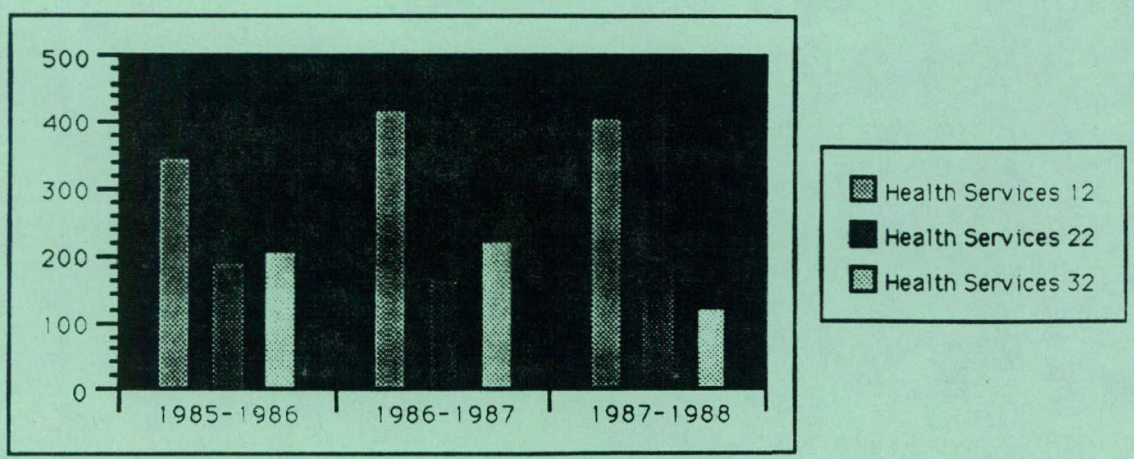
Building Construction - Enrollments



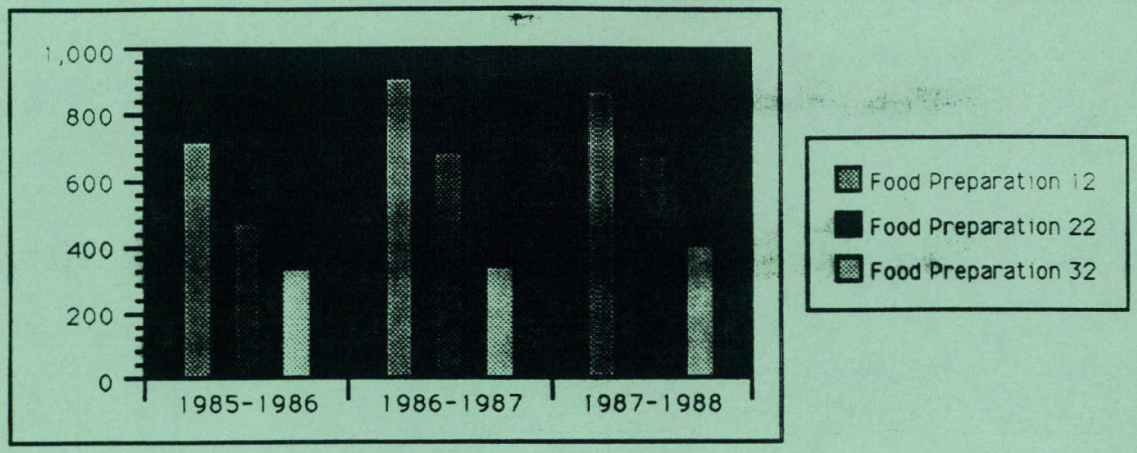

Electronics - Enrollments



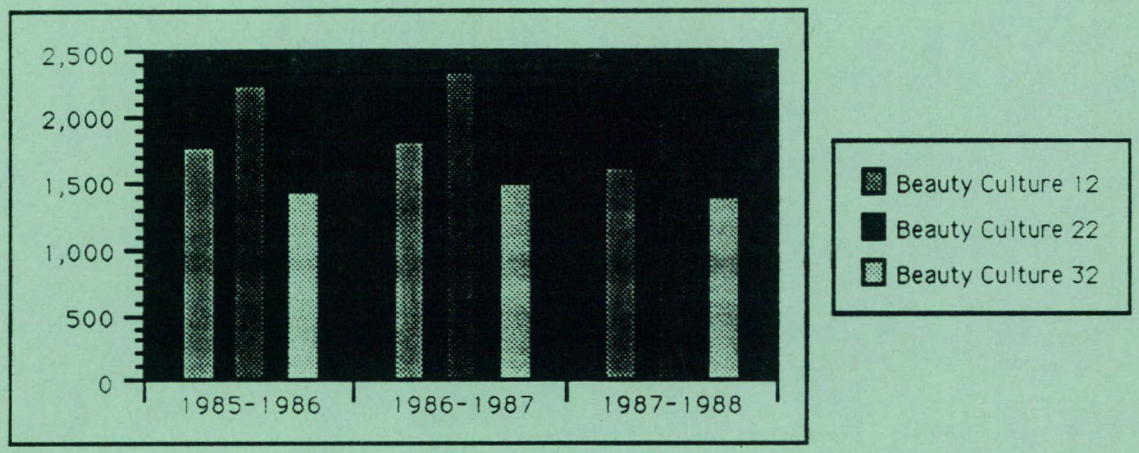

Health Services - Enrollments



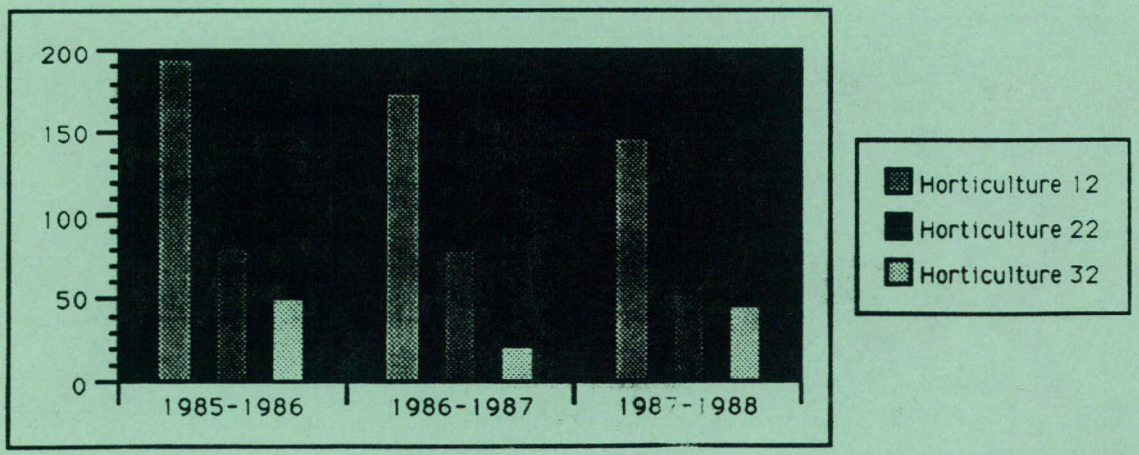
Food Preparation - Enrollments

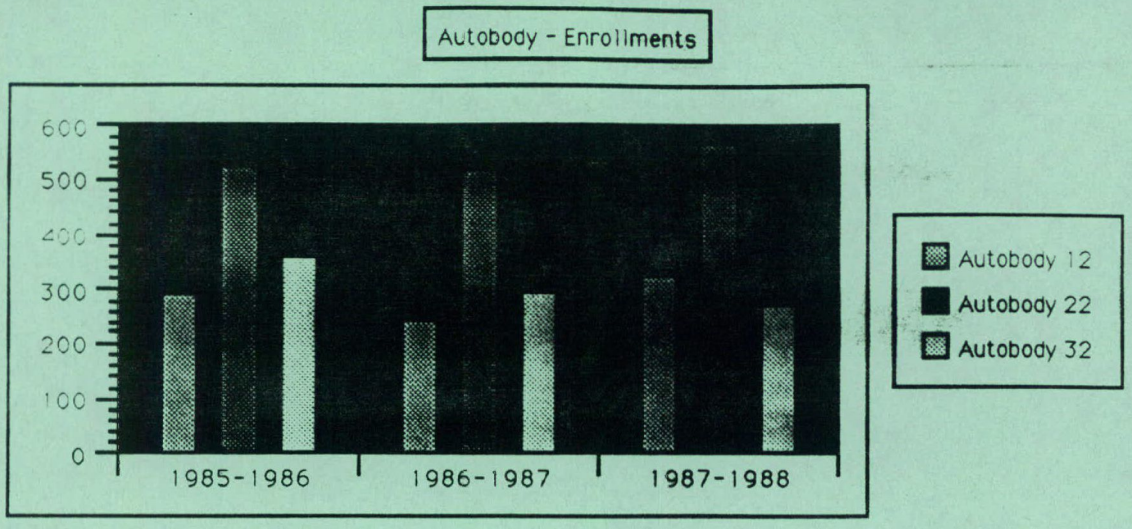



Beauty Culture - Enrollments




Horticulture - Enrollments




Autobody - Enrollments
600
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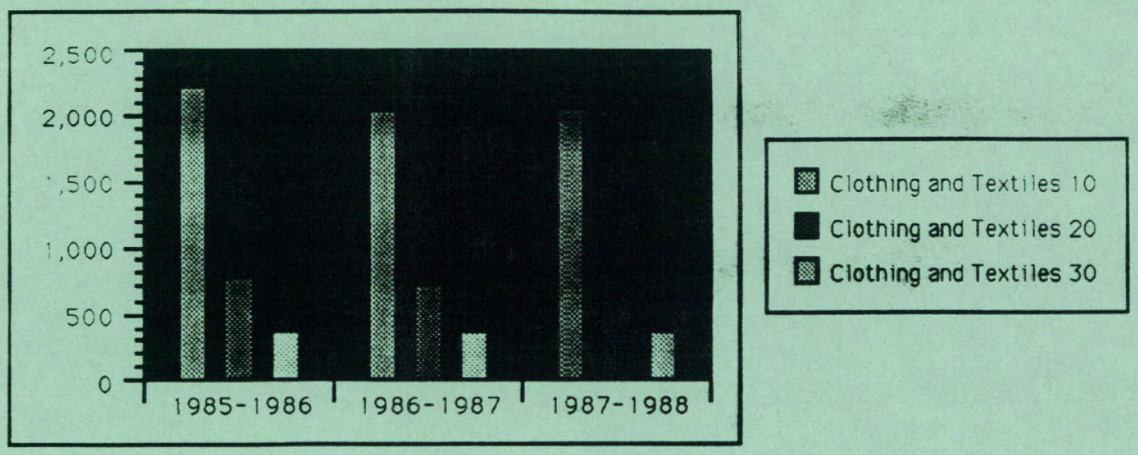
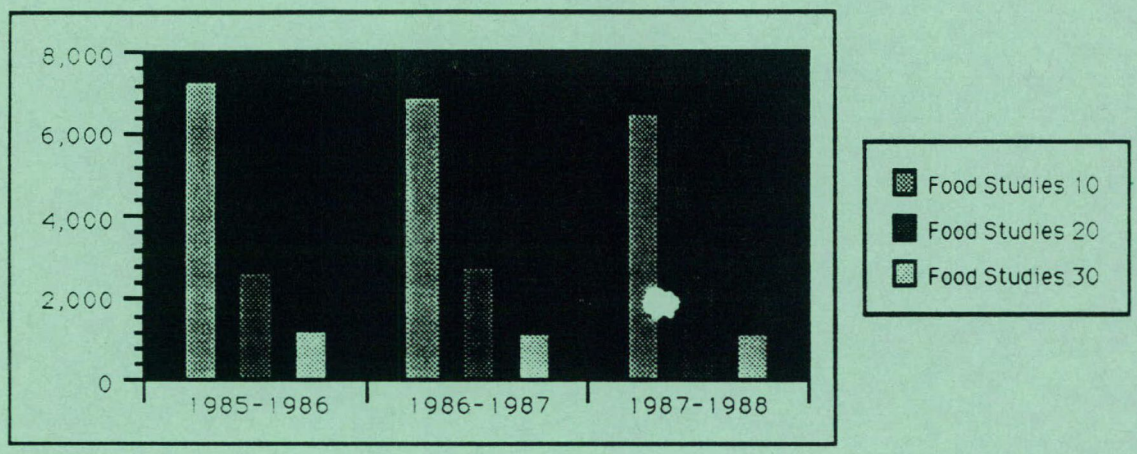
1987-1988
Autobody 12
Autobody 22
Autobody 32

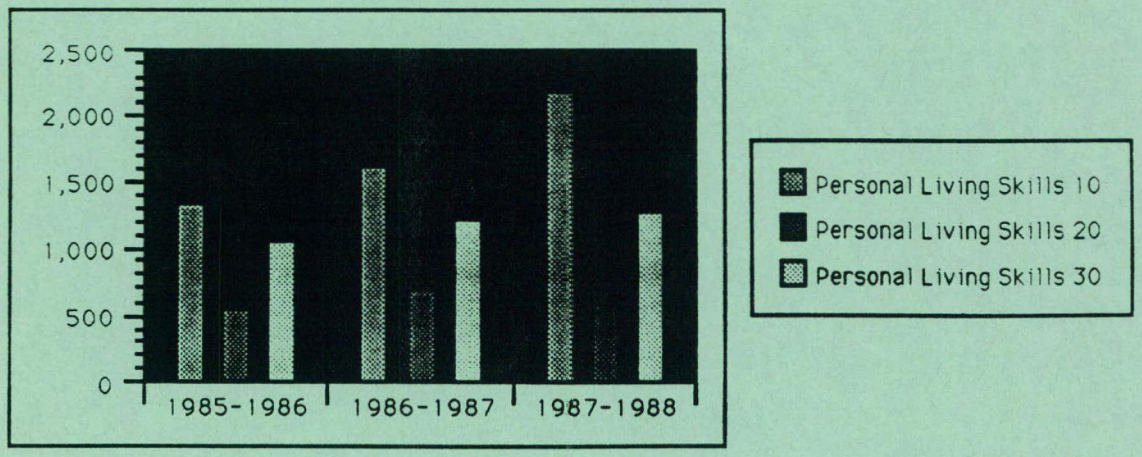
Clothing and Textiles - Enrollments



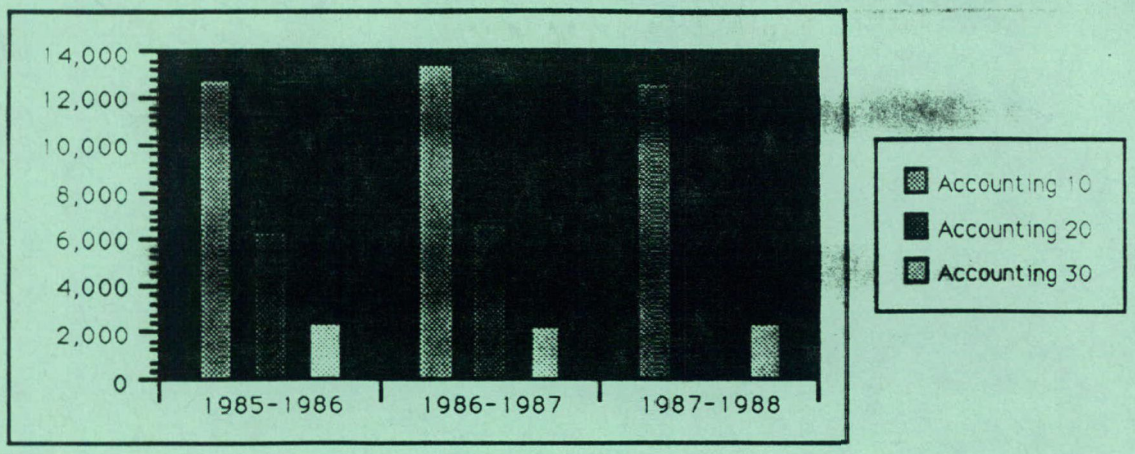

Food Studies - Enrollments



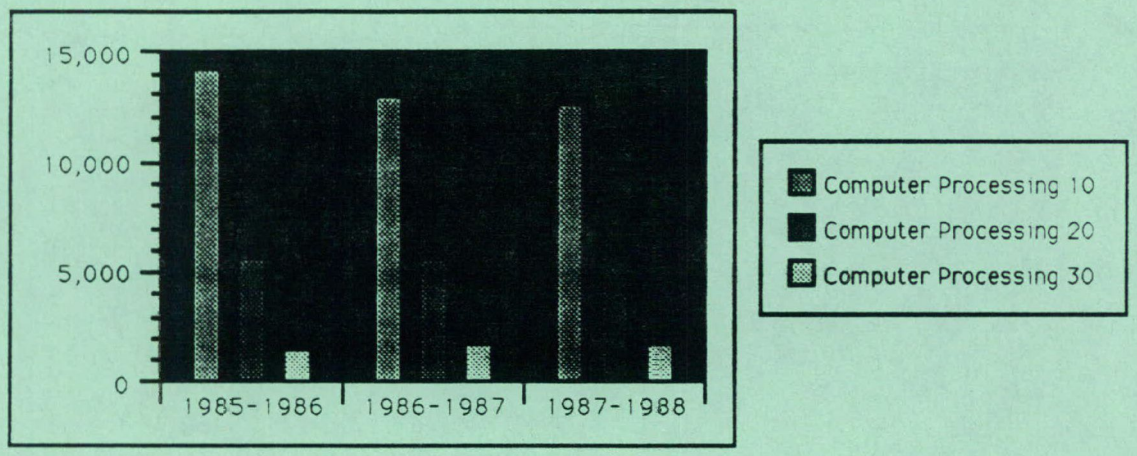

Personal Living Skills - Enrollments



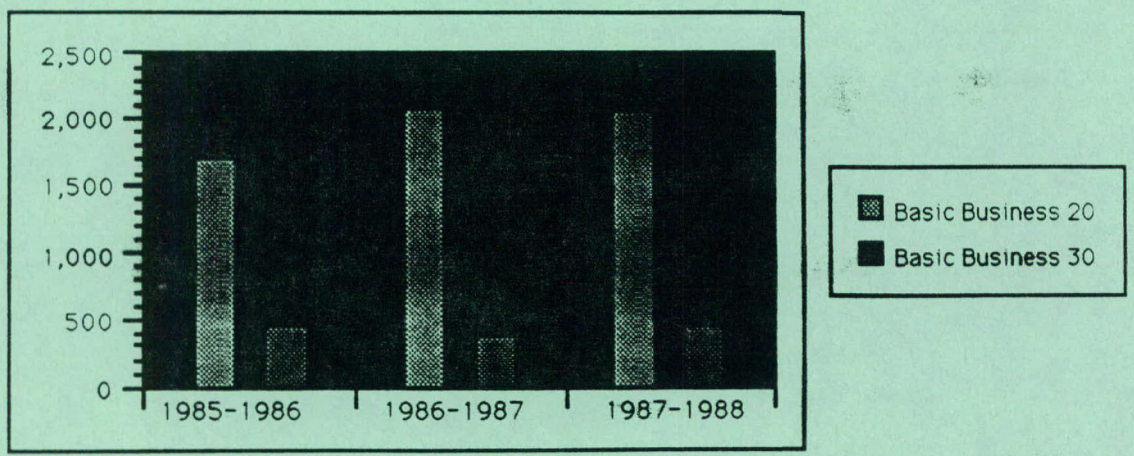
Accounting - Enrollments



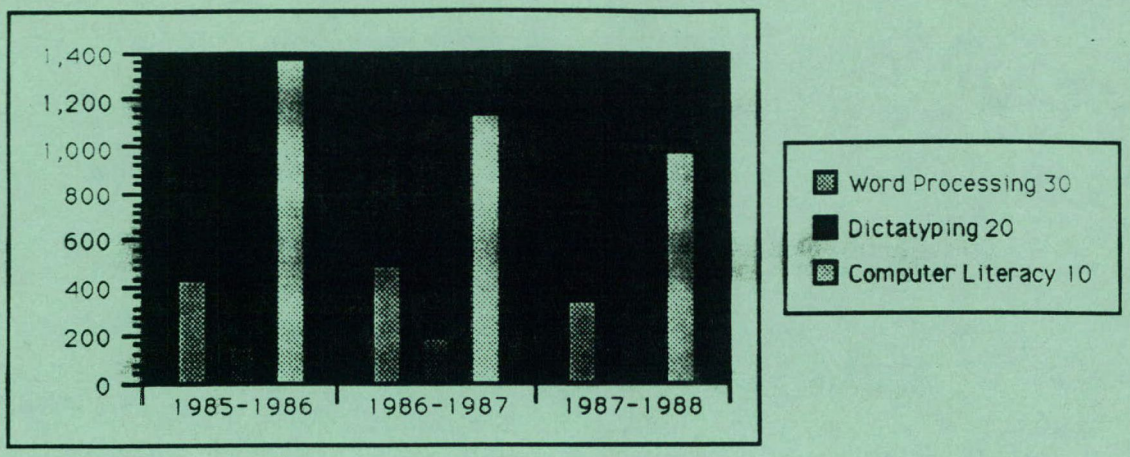

Computer Processing - Enrollments



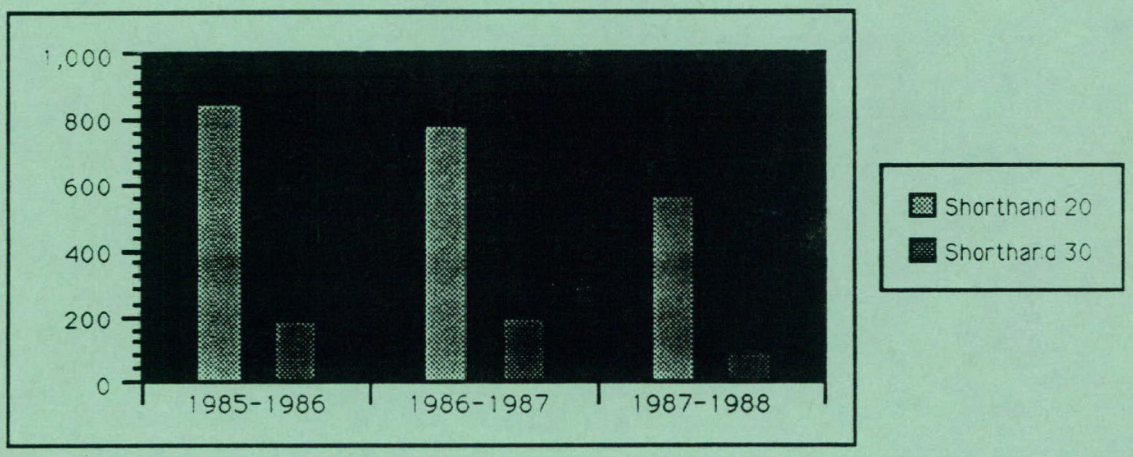

Basic Business - Enrollments

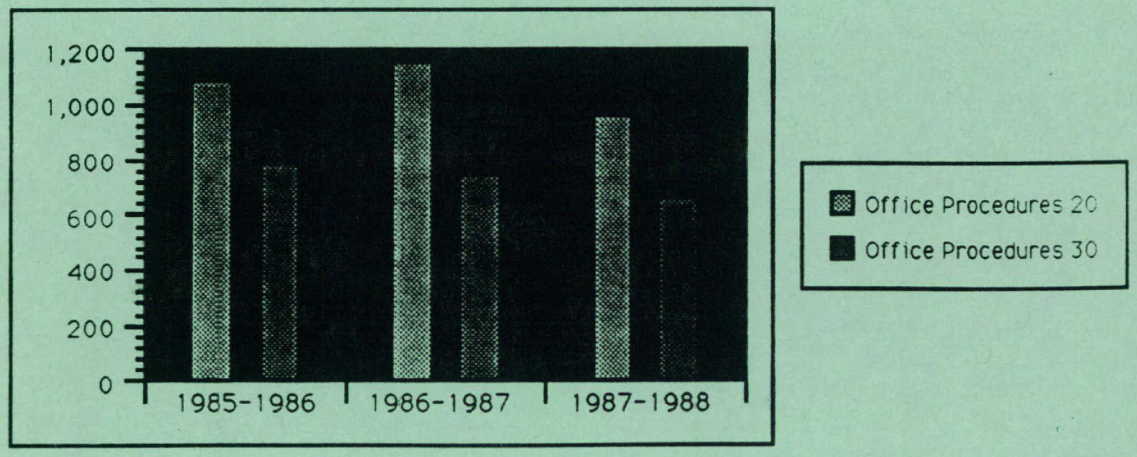


Business Education - Enrollments




Shorthand - Enrollments




Office Procedures - Enrollments